Highlighting South Bethlehem

An Architectural Lighting Plan

HIGHLIGHTING SOUTH BETHLEHEM

Architectural Lighting Master Plan

Prepared for:
THE CITY OF BETHLEHEM
and
The Architectural Lighting Committee of the
South Bethlehem Historical Society

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Jim Burns, formerly of PPL Corp
Steven Glickman, architect and South Bethlehem Historical Society board member
Sally Handlon, president, South Bethlehem Historical Society
Tony Hanna, Director of Community and Economic Development, City of Bethlehem
Darlene L. Heller, Director of Planning and Zoning, City of Bethlehem
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Ken Smith, Community and Government Affairs, Lehigh University
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TABLE OF CONTENTS

PAGE

TABLE OF CONTENTS
(CONTINUED)

PAGE

How to Use the South Bethlehem Architectural Facade Lighting Master Plan

It is highly recommend that the reader follow one of the suggested paths of investigating this master plan. The information has been laid out in a logical order to be read as a complete book. However, various readers will have differing levels of interest in all of the material that is presented in this plan. Therefore, we suggest choosing one of the following methods of approaching the plan:

For Architectural Lighting Committee Members

- Start at the Preface and read through the plan.
- Take time to carefully review the concepts presented in Chapters 1 and 2; they are the foundation of this plan.
- Learn the basics of each technique in Chapter 3 and be prepared to discuss them with others.
- Carefully review Chapter 4 to understand how the South Side is viewed from a distance and how the buildings visually interrelate with one another.
- Chapter 5 should be used for reference purposes.
- Read and understand Chapter 6. As the plan is implemented, building owners may need help with some of the topics.

For Building Owners

- Read the Preface and Why Master Plan section to understand the history and objectives of this plan.
- Skip ahead to Chapter 5; read the introduction and find your building (if you haven't already). Please remember, only selected buildings have been featured in this plan, but all building owners are encouraged to participate.
- Go to Chapter 3 and review the techniques used on your building.
- Look through Chapter 4 and find how your building or surrounding structures affect the skyline views of South Bethlehem.
- Continue by finding buildings that are close to yours or that simply interest you in chapter 4; then locate their design concepts in chapter 5, and research each technique in Chapter 3.
- To learn more about the objectives of this plan, go back and read Chapter 1.
- To learn about the design process and things your lighting designer should be considering, read Chapter 2, including Owner and Community Responsive Design.
- To learn about phasing, mock-ups, and maintenance, turn to Chapter 6.

For Lighting Designers

- Read the Preface and Why Master Plan section to understand the history and objectives of this plan.
- Read Chapter 2 to understand some of the design issues.
- Skip ahead to Chapter 5; read the introduction and find the building you are lighting. Please remember, only selected buildings have been featured in this plan, but all building owners are encouraged to participate.
- Go to Chapter 3 and review the techniques used on your building.
- Look through Chapter 4 and find how your building or surrounding structures affect the skyline views of South Bethlehem.
- Continue by finding buildings that are close to yours in chapter 4; then locate their design concepts in chapter 5, and research each technique in Chapter 3.
- Keep in mind that this plan outlines concepts for a cohesive yet interesting cityscape; the designer must use appropriate judgment after reviewing all the information contained in this plan.
- For additional information, the designer should review Chapters 1 and 6.

For Community Members

- Read the Preface and Why Master Plan section to understand the history and objectives of this plan.
- Look through Chapter 4 to better understand South Bethlehem's Views and Vistas and to identify buildings of interest.
- Look up any buildings that are of interest in chapter 5 to see their potential lighting effects.
- Go to Chapter 3 to gain a better understanding of each lighting technique.
- To learn more about the objectives of this plan, go back and read Chapter 1.
- To learn about the design process and things a lighting designer should be considering, read Chapter 2, including Owner and Community Responsive Design.
- To learn about phasing, mock-ups, and maintenance, turn to Chapter 6.

PREFACE

In May of 2002, Brinjac Engineering, Inc. was commissioned by the City of Bethlehem to develop an architectural lighting master plan for South Bethlehem. The purpose of the plan is to give structure and direction to the outdoor vision set forth by the Architectural Lighting Committee of the South Bethlehem Historical Society. We hope that the plan you are now reading offers clear rationale and guidance for implementing a lighting program, one that accentuates the varied architectural features of South Bethlehem, which is so rich in community, industrial, and ethnic history.

From the beginning, a strong motivation for lighting the South Side was the community's awareness that the city's history is dramatically shown in the style and function of the constructed world. The Lehigh Canal and Bethlehem Steel facilities, dating from 1829, reflect great chapters of American industrial history. The skyline of church steeples testifies that from 1850, South Bethlehem recapitulates better than most American cities the full pattern of ethnic immigration to this country from eastern and southern Europe. These artifacts deserve not just preservation, but celebration as well.

In 1999, South Side residents and business owners discussed ideas for architectural lighting as a way to promote the South Side and to increase safety. The concept was taken to additional community members, and the Architectural Lighting Committee was formed. In February of 2000, the Committee held a community meeting to gauge public response to the program, and they found the response quite favorable. Indeed, Lehigh University and one large South Side church were already planning to illuminate historic structures.

The Architectural Lighting Committee's program was very timely. In the summer of 2000, the City initiated the South Side Master Plan. Several public meetings were held to encourage community participation. The South Side Master Plan was developed by the same firm that had recently completed a Master Plan for Lehigh University. Along with creating stronger ties with the University, the Master Plan also provided recommendations on issues such as economic development, capital improvements, housing, safety, design guidelines, community relations, and public policy.

Architectural and streetscape lighting was identified by the South Side Master Plan as an issue to be addressed. With the strong public support for the overall Master Plan, the Architectural Lighting Committee and the City of Bethlehem have commissioned this Lighting Master Plan to continue the planning process recommended in the South Side Master Plan. Along with the various community members involved as part of the Committee, the design team also gathered public opinions from communitiy members while surveying. In addition, a public presentation was held to gather and review community response to the Lighting Master Plan.

Why a Master Plan?

The many independent solutions to architectural lighting projects do not necessarily lead to well designed streetscapes that function as a city. Master planning can help set a precedent and establish guidelines so that the ongoing process of incremental growth does not lead to visual chaos and fragmentation.

A design for individual facade lighting projects based solely on whim or personal preference would provide no guidance for future lighting projects. At present, everyone is entitled to light their buildings as they wish, and individual lighting design and illuminated signage can pop up at any time. When combined, all of these luminous sources can create a visually chaotic scene that is far from attractive. That is why the thoughts, designs, and ideas presented in this report are based on research, history, and principles of human perception. It is in the underlying data that future decisions may be based.

The plan does not merely focus on the technical aspects of lighting according to standard practice, economy, and efficiency, but rather on creating exciting and attractive environments for people, where they can feel safe and secure. It is a common sense, humanistic approach with technical backup.

Finally, this master plan should be thought of as a work in progress; a living document that grows in future years and becomes a piece of an entire outline with other development plans for an improved downtown.

Figure 0.1 *Hill to Hill Bridge*

As the redevelopment of South Bethlehem occurs with Beth Works and the implementation of the South Side Master Plan, the streetscapes of the town will change. It is vital to this community that the night environment remain friendly, inviting, and comfortable for everyone to enjoy. Whether it is a college student walking home from Tally Ho or a family visiting the Bridgeworks Restaurant, everyone should feel secure and welcome in town after dark. A clear lighting master plan with community support and well written lighting ordinances can help ensure a visually pleasing and inviting result.

CHAPTER 1

ARCHITECTURAL FACADE LIGHTING DESIGN PRINCIPLES

People Places - Revitalizing the Charm of Downtown

Figure 1.1 *Rome*

Figure 1.2 *Paris*

Figure 1.3 *Tokyo*

Tourists and vacationers that visit cities throughout the world number in the millions. What is so attractive about cities such as Rome, Paris, Tokyo, or New York?

The old streets of cities in Europe, or even in older American cities such as South Bethlehem, have a sense of human scale, a feeling of comfort, appropriateness, and a place where people enjoy gathering. Whether gathering on the deck of Tally Ho or in front of the low scale Design Center (formerly McCrory's 5 & 10), the streets of South Bethlehem provide a unique atmosphere. The specialty stores and restaurants, rich in ethnic background, can only be found in a turn of the century town such as South Bethlehem. These streets were designed by people for people.

Figure 1.4 *The Design Center*

A unique opportunity exists to draw a lot of business to downtown without the heavy automobile traffic incurred by other cities. The student population of Lehigh University can be drawn into the city between or after

classes. Streetscapes with lighted corridors (building facades) and highlighted landmark buildings can help draw students into town, as well as encourage people from the surrounding communities to come downtown to shop and dine.

The streetscapes of a community, neighborhood, or city are probably the most powerful indication of the state of the urban fabric.

The streetscapes of a community, neighborhood, or city are probably the most powerful indication of the state of the urban fabric. They provide a certain emotion, personality, and reputation of the place; they create an image in the mind of the users. If the streets are perceived as safe, secure, and exciting, they encourage all citizens to use and take pride in their city. If on the other hand, the streets appear confusing, poorly maintained, and cold, they are perceived as an uninviting, dangerous place that lacks civic pride.

Humans are social creatures and enjoy being with each other. If a place feels exciting, fun, and provides safety and security, people will gather in that area. As a result of more people gathering, the area will feel more secure, and generate even more excitement. This effect can be seen in Harrisburg, Pennsylvania. Years ago, City Island was known as a place for drugs and other illegal activities. Downtown Harrisburg was ranked as one of the country's worst cities. The redevelopment of City Island to a ball field and other family activities draws thousands of people a year. Downtown Harrisburg brings people from Baltimore and Philadelphia to visit and find out what the excitement is about. Only five years ago, all on-street parking was empty at 8:00pm and shops and restaurants closed. Today, Thursday through Saturday nights the meters and garages are parked full and the sidewalks are bustling.

Figure 1.5 *Downtown Disney*

The creation of districts as proposed in the South Side Master Plan provides the opportunity for a similar revitalization of South Bethlehem. As the districts develop and community response is favorable, the nightime safety, security, and convenience of downtown will become more and more important. The ability of merchants, both new and old, to work together will be key to ensure a visually pleasing environment.

Currently both the South Side and North Side of Bethlehem have several examples of good exterior lighting. The Cathedral Church of the Nativity added exterior lighting to the facade as part of recent renovations. The church creates a dramatic focal point as a visitor enters town across the Hill to Hill Bridge. Packer Chapel, on the campus of Lehigh University, provides a strong point of orientation for both students and the community. Structures such as Central Moravian Church, United Church of Christ on Market Street, and the First Presbyterian Church on Center Street are all good examples of lighting programs on the North Side of Bethlehem. By no means is this a comprehensive list of all lighted structures, only a small sample of some well designed structures. These structures were not included in the written portion of this report. However, the lighting techniques used were taken into consideration to ensure the creation of a well designed streetscape and skyline.

Objectives for Good Facade Lighting

The basic objectives of facade lighting can be grouped into four interrelated categories:

- **Skyline Views**
- **Orientation**
- **Streetscapes**
- **Civic Pride**

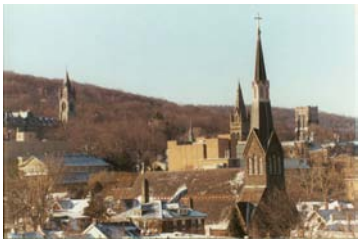


Figure 1.6 *Steeples in winter*

Skyline Views

From a distance the city's skyline should create a distinct image that has a sense of anticipation. Various arteries to the city will offer different skyline views. From Bethlehem's City Hall and the Fahy Bridge: the Rooney House, Holy Infancy Church, and Lehigh University have commanding visual presence. Entering from the Hill to Hill Bridge: the Cathedral Church of the Nativity, Lehigh Valley Railroad Building, Wilbur Mansion, and Sayre Mansion greet the traveler to town. University students have a unique view of town from atop the hill: the dense tree canopy and university buildings obscure the skyline view allowing only glimpses of the overall scene. From the East, spectacular views of the Bethlehem Steel stacks and equipment mark the entry to a town rich with heritage and strong industrial ties.

Orientation

Well designed patterns of streets add to the aesthetics and enjoyment of a city. Both drivers and pedestrians need quick and effective orientation; that is, the development of a visual sense of their location, destination, and pathways. This is of clear importance for safety, security, and convenience. The architectural facade lighting program should be coordinated to express and clarify the overall structure and organization of the city layout. Highlighting of important features such as nodes, monuments, landmarks, paths, or edges can enhance nighttime orientation.

Figure 1.7 *Custom House Tower, Boston, MA*

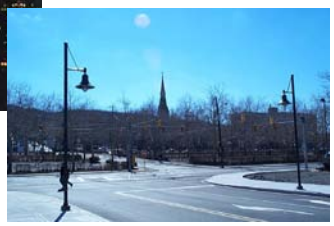


Figure 1.8 *Holy Infancy Church from a distance*

Boston is a great example of orientation by landmark structures. As shown in Figure 1.7, the Custom House Building provides visual direction day or night. With great structures such as the Hill to Hill bridge and highly visable church steeples, South Bethlehem can provide plenty of visual cues from various points in town. Figure 1.8 demonstrates how visable the Holy Infancy Church steeple is from around town.

Streetscapes

As you move toward the center of the city, the pride of downtown should be revealed in warm, inviting, safe, and secure streetscapes. Expressing the beauty of the city's historically and culturally significant structures will entice more people to visit, shop, and dine in town. As the visual walls of the street brighten and interest grows, so will the crowds. This transformation is not instantaneous, and may take some time.

The streetscape program is particularly important to attract students from Lehigh University to spend time and money in the downtown area.

Figure 1.9 *Residential street*

Civic Pride

Civic pride and any beautification program go hand in hand. A beautiful town generates a sense of pride. State College, Pennsylvania is another town bordered by a major university. The civic pride of State College is enormous. The residents and merchants are proud to be a part of the community. This pride shows through the tremendous involvement found in events throughout the entire year, not just during the traditional school year. Building owners throughout South Bethlehem should be encouraged to show their pride by lighting their buildings in a responsible manner to create an overall positive image of town.

Figure 1.10 *Musikfest*

Results of Achieving These Objectives

The desired outcome of this project has several beneficial results. If all four objectives are achieved, community pride will elevate to a new level. Regional and non-regional tourism could increase, thus strengthening the local economy. An increased level of awareness of physical sites and the cultural and historic signifigance they represent will lead to better historic and architectural preservation. Increasing excitement to be downtown will draw more people, thus creating a higher level of safety and sense of security.

All of this will create a stronger partnership between the grass roots community members of the city, Lehigh University, and Beth Works.

"If you have something that's beautiful and you're demonstrating that, people are going to be drawn to it."

--Sarajane Williams, as quoted in "The Morning Call," Friday, July 26, 2002

CHAPTER 2

RESPONSIVE LIGHTING DESIGN PRINCIPLES

Community Responsive Design

An exterior lighting design should be responsive to the community in which it is located. The design should take into consideration the feelings of the people who will experience it on a daily basis—the citizens of the community. Because of the great variety of individuals in the community, each with their own set of values and preferences, there is a large number of issues the designer must confront in order to satisfy the community and create a successful project.

Light Trespass

Light trespass is "unwanted light that falls beyond the property line or area intended to be illuminated." When introducing a new light source to an area, it is desired to limit the amount of light that spills over onto adjacent properties, in order to minimize disputes between neighbors. When doing the initial lighting design, the design professional must inspect the properties adjacent to the object or area that he or she is lighting. The goal is to determine where any potential conflict areas lie, and to eliminate those conflicts in the design stage, before they arise in the field.

The designer should also be careful in selection and location of the light fixtures. The fixtures should have

precise optical control in order to direct the light onto the surfaces where it is desired. When possible, a fixture should be selected that is well-shielded, or has the potential to be shielded should the need arise in the future. Aiming of the fixtures is also important; floodlight aiming angles should be very precise to keep the light in the intended lighted area and out of areas is where it is not wanted.

Figure 2.1 *Bad light trespass*

Light Pollution

Light pollution is "light that is directed upward to the sky or reflected from surfaces that interferes with astronomical observations or appreciation of the night sky." Particles in the air, such as dust and water vapor, reflect and scatter light that is emitted into the atmosphere, resulting in this light pollution or "sky glow." One of the best ways to control light pollution is to limit the amount of light leaving a fixture from the horizontal or above. The designer should also attempt to minimize the amount of non-target illumination; that is, when projecting light upwards, the system should be designed to apply the light only to the desired object, with as little light as possible spilling out into the atmosphere. The image in figure 2.2 was taken just a few miles from a prison in Arizona. Light pollution from the prison makes it look like sunset. Figure 2.3 is a satellite photo of the U.S. from space. All of the light reaching the satellite is wasted energy.

Design principles should lead to an enchancement of visual signals and a reduction in visual noise.

Figure 2.2 *Example of light pollution*

Figure 2.3 *Night view from a satellite*

Appropriate Community Design

The lighting of buildings' facades can define the urban character and image of a community. For example, Las Vegas, Nevada and Williamsburg, Virginia are both popular tourist destinations. However, they both have significantly different images and characters, particularly at night. Illuminating the historic buildings in South Bethlehem will reveal the rich history of industry and cultural diversity. Consistency and coordination with specific tecniques outlined in this plan will strengthen the public perception. By layering the light to create visual anchors and landmarks, visual orientation can be improved and a sense of community created. Following the historic community theme, lighting equipment for each building should be integrated so as to not detract from the daytime scenes.

Owner Responsive Design

The lighting designer must not only consider the community in the design process, but also the owners of the individual building or structure. Each owner has a certain image of his or her business or organization that he or she wants to project. The lighting designer can help better portray this image by lighting the structure in an effective manner. In addition to projecting a certain image for an owner, the lighting professional must also consider maintenance on the lighting system, energy consumption, and cost.

Maintenance

Properly maintained equipment results in a functional lighting system that suffers little from wasted power, misaligned light fixtures, and lamp burn-outs. When outdoor lighting equipment is operating as designed, it

suggests civic pride and a continuing concern about public safety and security. Good maintenance includes more than just keeping the light fixtures clean and relamped. There are important decisions to be made in the inital design. These decisions affect maintenance, and include selecting the proper light fixture, lamp, and other system components; accommodating light fixture accessibility; and considering the level of system maintenance that will actually be implemented.

Figure 2.4 *Poorly maintained floodlight*

Several steps can be taken during installation to facilitate the future maintenance process. Ground-based equipment should be mounted where it is accessible for easy inspection and maintenance. All switching devices such as circuit breakers, contactors, and switches should be clearly labeled regarding the circuits and equipment they control. Except under rare circumstances, the light fixture power feeds should be run underground in conduit, avoiding the use of overhead wiring. All light fixture components and aiming devices should be securely fastened and tightened. Finally, all equipment should be thoroughly tested to make sure it is operating as specified.

Energy

Besides maintenance, the lighting designer should also be sensitive to the amount of energy consumed by the lighting system. The selection of light fixtures, lamps, ballasts, and number of fixtures will all affect how much energy the system uses. Saving more energy not only puts more money in the pockets of the building owner, but is also an ecologically friendly solution, which further enhances the image of the owner. In figure 2.5, the blue shading represents the old 1000 watt floodlighting that lit the Pennsylvania State Capitol. The yellow represents the properly selected 100 watt floodlight that is now used to light the dome. The energy savings paid for the installation in a little over one year.

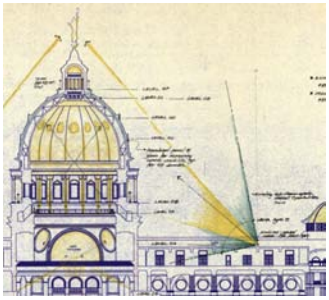


Figure 2.5 *Pennsylvania State Capitol*

Cost

Materials--The lighting designer should attempt to create a cost-effective design in ways other than just energy consumption. He or she must address the material cost of the lighting system, both on a first-cost basis and according to the life of the system. Equipment selection will determine the cost of replacing component parts, and the frequency with which that replacement will have to occur.

Labor--Besides material cost, labor cost must also be considered. The choice of light source and daily operating schedule will determine how often lamps must be replaced; light fixture mounting method and location will affect how often the fixtures must be cleaned; and the quality of equipment selected will determine component life expectancy, which dictates how often those components must be replaced.

Design Principles

The general objectives that are outlined can be translated into a series of practical design principles that serve as guidelines for the development of the lighting master plan and the execution of future lighting designs. In formulating these principles, it is helpful to remember that the lighting system is a means to provide or transfer visual information, relevant to these basic objectives.

Figure 2.6 *Greater Harrisburg Fire Museum*

Illumination (quantity of light)

Good transfer of a visual signal is not necessarily based on the absolute quantity of light, but rather uniformity and contrast. A uniformity ratio compares the average light level across a surface to the minimum value on that surface. According to the Illuminating Engineering Society of North America, the recommended uniformity ratios for an even wash is a range of between 3:1 and 6:1, average to mini-

mum. It is only in the change or anomaly in a regular pattern that attracts attention. A change of 10:1 is considered noticable, while 50:1 is obvious.

Care must be taken not to overwhelm nearby buildings or lighting installations. "Light Wars" occur when one building owner feels that in order to be noticed, he must light his building brighter than his neighbor's building. Then a third building owner puts twice as much light on his building, and so on. It becomes a war that everyone loses, including visitors to the city. Through the Lighting Master Plan, a building heirachy is established that best benefits the City as a whole.

Limiting Glare

A common source of visual noise is glare caused by luminaires with improper beam control. Independent of illumination, glare levels make the task of seeing more difficult and produce a subtle sense of discomfort or annoyance. The lighting system should be designed to minimize glare.

Figure 2.7 *Example of glare*

Glare can be broken down into two categories. First is discomfort glare. Discomfort glare causes the viewer to squint and can detract from the object being viewed. Disability glare is the second type, and a more severe condition. Disability glare can cause a total loss of vision such as looking at on-coming high beam headlights.

It may not be possible to completely hide every light fixture, but efforts should be made to avoid glare. Proper fixture selection and location can help limit this potential issue.

Figure 2.8 *Color washing of facade*

Use of Color

The use of color can be very dramatic and playful on a building facade. It can be used to create a mood or tell a story. For example, the color projected on a building can be changed every evening to forecast the weather for the following day (yellow-sun; blue-rain; white-snow, etc.). Color has significant impacts that must be considered early in design. A large amount of green light bouncing off a building facade could give pedestrians a sickly appearance. Just as when color is applied to interiors, surrounding color schemes must be considered to maintain an aesthetically pleasing view of the city.

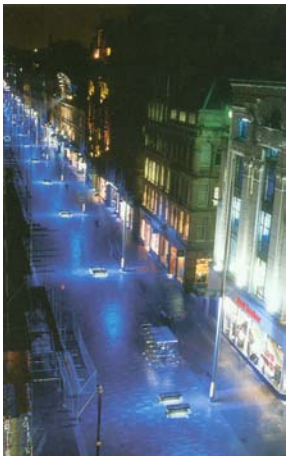


Figure 2.9 *Example of color on streetscape*

Use of Texture

Texture can give life to a facade or create a meaningful statement. Grazing a stone or brick facade can show the material and structure of a building in a manner that has never been seen before. When viewed by flat ambient daylight, a stone wall has small bumps; at night that same wall can show large, random, beautiful patterns in the stone offset.

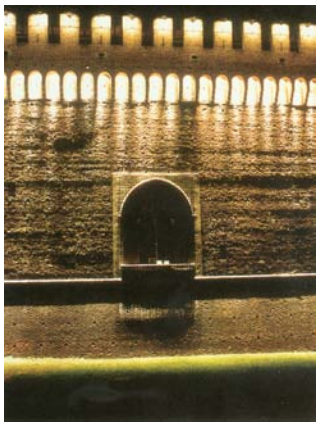


Figure 2.10 *Grazing of wall*

Figure 2.11 *Example of grazing*

CHAPTER 3

LIGHTING TECHNIQUES

Methods of Architectural Lighting

Structure lighting serves many purposes and communicates prestige, safety, symbolism, and recognition. Whatever the application, distinctive, well designed lighting is one of the best ways to attract attention and make a favorable impression on the viewer. When properly applied, lighting can help enhance the intrinisc charm, beauty, and utility of any setting. With the loss of natural light at night, often the identity of a structure is destroyed. Proper lighting can strengthen or subdue major elements of a building. Many dynamic possibilities exist.

Nighttime lighting can be applied to a single structure or a set of structures. It can give distinction to a building, or unify a community. Careful coordination can create focal points with major structures and subdued lighting patterns for secondary buildings. Circulation patterns can be reinforced and the entire community unified. Well planned nighttime lighting can make an important contribution to the success of any urban planning project.

The following techniques focus on the essential methods of good structure lighting.

Floodlighting

Floodlighting is comprised of a general wash of light across a facade, utilizing a few basic methods. Floodlighting can be done from below or above a surface, and from close to or far away from it. When used correctly, it allows designers to create anything from the most dramatic, exciting statement to the most subtle impressions.

A floodlight that is placed very close to a surface will graze the texture and add depth to small reveals. This can be an attractive feature on stone or brick walls where the texture is desireable and rarely seen its full glory. However, caution must be used because grazing a wall that should be flat can show any imperfections. Reflective surfaces can cause veiling reflection which can be very distracting. Large offsets in structures must be handled appropriately to prevent uncomfortable or unnatural shadows from appearing. An example of this is the human face. During the day, ambient light, typically from above, casts natural shadows. However, when a flashlight is held to a person's chin, it reveals deep eye sockets and an inverted nose shadow, giving the face an unnatural appearance. Care must be taken in lighting building facades to create comfortable shadows.

A floodlight placed farther away from a surface provides very little shadowing of textures. It is important to note that as the light is moved away from the facade, the shadows flatten and become softer. These softer, attenuated shadows give the viewer a strong impression of what the architecture looks like. This is sometimes less dramatic than grazing, but less likely to interfere with large elements on the facade.

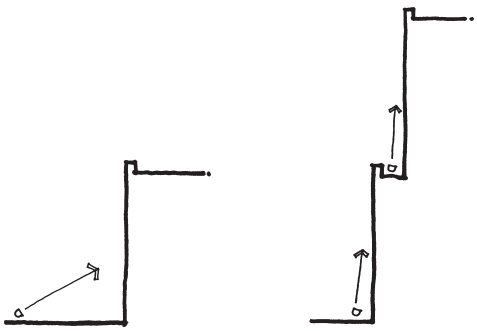


Figure 3.1 *General Floodlighting*

Often a combination of the structure's shape, surface detail, and physical site constraints will be used to determine if it is a candidate for grazing, washing, or a combination of floodlighting techniqes. Holy Infancy Church's steeple is a prime structure to be floodlighted with some very precise, optically controlled spotlights.

Figure 3.2 *Founder's Hall at Milton Hershey School*

Figure 3.3 *Holy Infancy Church*

Selective Highlighting

This technique is similar to floodlighting, but tends to use low wattage fixtures to accentuate smaller details of the structure. These smaller fixtures can easitly be hidden in architectural details so they blend into the structure during the day. An ornate cornice, such as the one found above the Design Center, is a perfect example of an element of a facade that may be selectively floodlighted.

Figure 3.4 *Greater Harrisburg Fire Museum cupola lighting detail*

Figure 3.5 Design Center detail

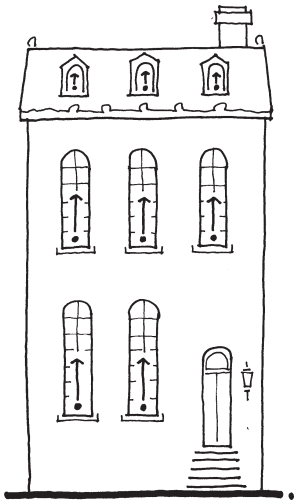


Figure 3.6 *Sketch of selective highlighting*

Silhouette

By illuminating the interior of the building or a simple facade behind an ornate one, the building's exterior architecture is expressed through darkness. This is appropriate when a building has a unique feature when seen against a bright background.

This technique is often done on facades with large porticos where the columns are silhouetted on the building face. Silhouette can be used effectively in combination with floodlighting. If one portion of a structure is floodlit, another can be seen in silhouette. This can occur if the lower level of a building has a unique roof line that stands out as a dark line against the floodlighted upper portion of the building. The Holy Infancy School on Fourth Street may consider silhouette lighting of the entry. By lighting the inside of the portico, the columns and arches at the front facade will be clearly defined, creating an inviting streetscape view. The bell tower of St. Peters Evangelical Church is another place that silhouette lighting could be dramatic.

Figure 3.7 *Milton Hershey High School*

Figure 3.8 *Holy Infancy School*

Transmitted Luminance

This is similar to silhoutte lighting, where the building is used as a lantern, and interior light glows through windows and other openings and defines the exterior.

Figure 3.9 *Rear facade of the Pinnacle Outpatient Care facility, Harrisburg, PA*

Facades of stores and restaurants often use this to allow potential customers to know they are open. Churchs are another prime example of where transmitted luminace can be successful. Backlighted stained glass windows can define a church's character without the need for exterior lighting. The stained glass windows in the First Hispanic Evangelical Church provide an excellent opportunity for a transmitted lighting effect.

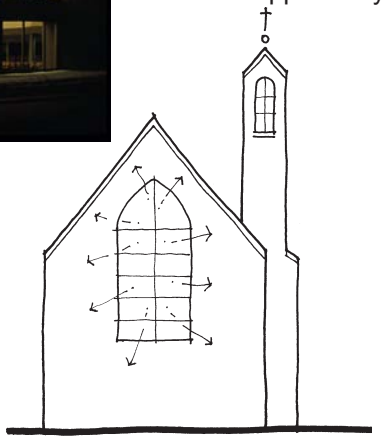


Figure 3.10 *Sketch of transmitted illuminance*

Figure 3.11 *First Hispanic Evangelical Church*

Delineation

This technique uses a thin line of light to outline the natural form of the building, separating and simplifying its shape. Many structures have a unique outline or feature that makes the form best outlined. Several sources can be used to create this effect. Fiber optic lighting is one of the newest and most exciting methods. Fiber optic outlining allows color changing to occur at any timed interval or manually. The McFarland building in Harrisburg has the unique sawtooth design outlined in fiber optic cable and the color is changed seasonally. The underspans of the Fahy Bridge could be lined in fiber optic cable. This is safe and allows the visitors of Beth Works to clearly see the modern flat deck structure from the new technology park.

Figure 3.12 *McFarland building, Harrisburg, PA*

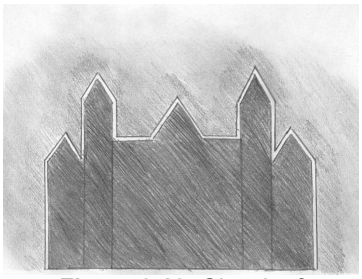


Figure 3.13 *Sketch of delineation*

Figure 3.14 *Fahy Bridge*

Point (Loci)

The loci technique uses small points of low voltage incandescent sources to outline an architectural structure. Widely placed “points in space” can be used to either imply or establish line or form.

Similar to delineation, this technique can be used to outline or define a structure or unique shape. Loci lighting is widely used near large bodies of water which can be viewed as a reflecting pool. Boat House row in Philadelphia is an example of an entire community that bonded together and highlighted all the buildings in this manner. It creates a very recognizable view from Interstate 76, across the river to the houses. The simplified form of the Walnut Street Bridge in Harrisburg is another example of loci lighting. The Hill to Hill Bridge, with its unique steel structures, provides a good opportunity for loci lighting.

Figure 3.15 *Walnut St. Bridge, Harrisburg, PA*

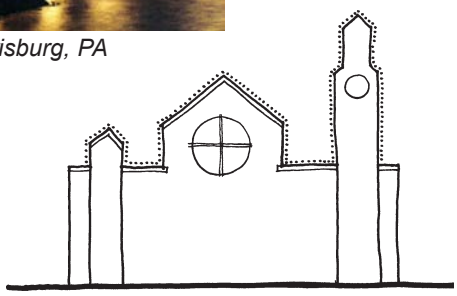


Figure 3.16 *Sketch of Outlining*

Figure 3.17 *Hill to Hill Bridge*

Ornamental

Ornamental lighting is often applied to the surface of the structure and is unrelated to the architectural form. Neon, incandescent lamps, and fiber optics are a few of the lighting materials typically used in this technique.

Ornamental lighting is often used at nightclubs, playhouses, art centers, and places that want to draw attention or create interest. The lighting can follow a specific shape or pattern, or it could be completely random. Along with fixtures that are applied to the surface, lights that project images on to the surface are also available. This can be used to draw attention to a specific building or enhance an entire neighborhood. The Banana Factory sign is a current example of ornamental lighting. The zig-zag shape on the wall adjacent to the Fowler Arts Center is a prime candidate for an applied ornamental light. The Rooney House, with the large flat brick walls on the North and South side could act as a billboard for community events. Projected art, graphics, and text on the building facade would be visible from around town, particulary as viewed while entering town on the Fahy Bridge.

Figure 3.18 *Wilma Theater, Philadelphia, PA*

Figure 3.19 *Sinai Samaritan Medical Center*

Figure 3.20 *Banana Factory*

Combination

Combining two or more of the previously listed techniques often results in the best effect. A few examples may be a gentle floodlight to wash a facade and add in some selective highlighting of a few unique features. Another combination is the selective highlighting of a church steeple combined with soft floodlight of the lower structure and a strong transmitted luminance through the stained glass windows. As one can imagine, the combinations and possibilities are endless. Care must be used in combining effects. Not all techniques work well together. For example, floodlighting a facade with an ornamental or delineated feature will not work because the floodlight will wash out the other effect. Often, combining too many effects can lead to visual chaos or a cluttered look. Keep in mind, simple is often better. It is also important to understand the techniques used on neighboring structures and how they impact your structure.

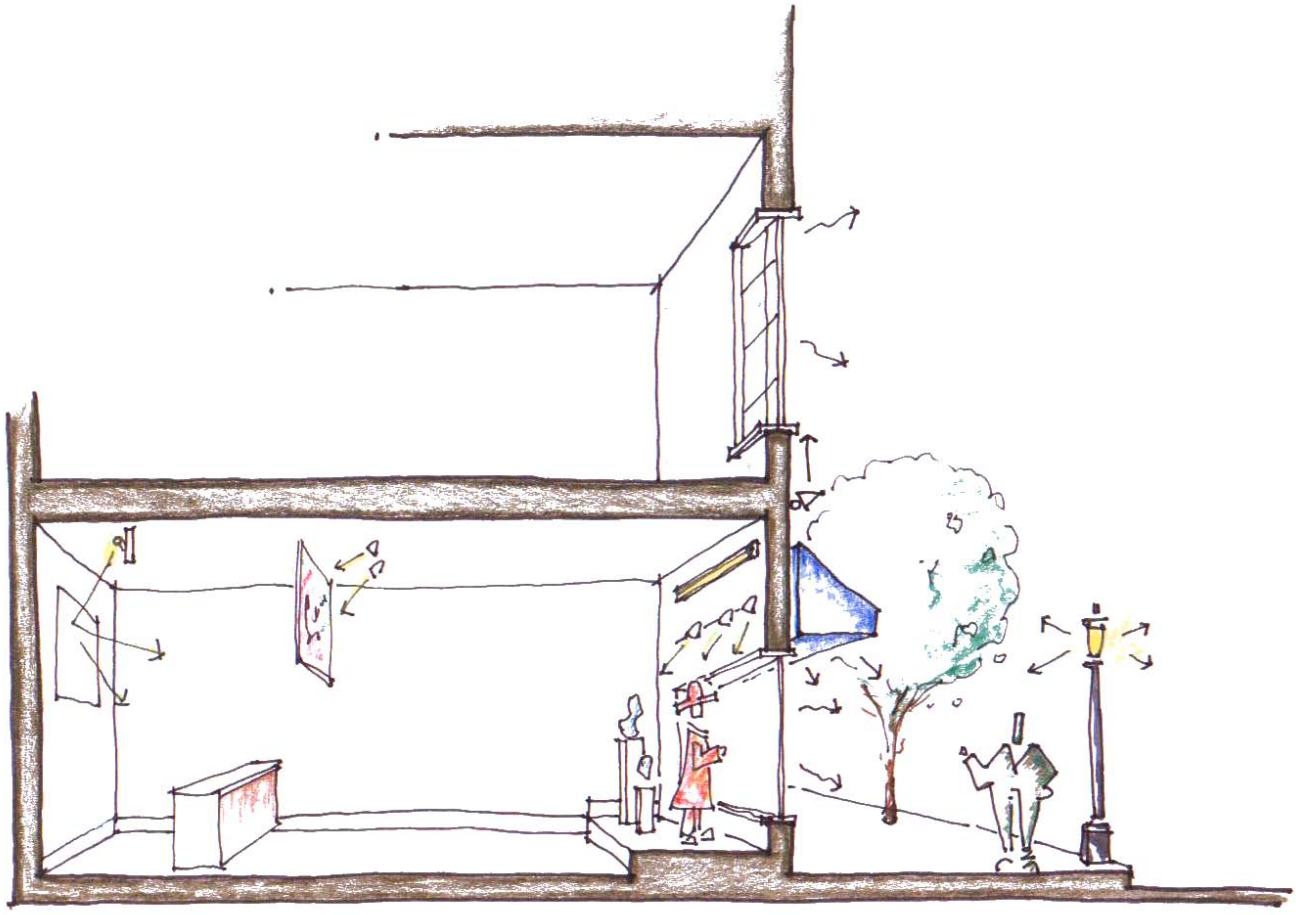


Figure 3.21 *Sketch of combining lighting techniques*

VIEWS AND VISTAS

The South Side of Bethlehem From a Distance

Architectural lighting is more than simply the illumination of individual buildings. The creation of a comprehensive cityscape is essential to give a unified image of the city to visitors and residents alike. The proper illumination of a city when seen from afar can help entice visitors into the city and increase revenue. It also instills a sense of pride in the residents who experience the city on a daily basis.

There are a number of ways to enter South Bethlehem. This report looks at four of the most prominent entryways that offer the most distinctive views of the city: the Hill to Hill Bridge, the Fahy Bridge, Lehigh University, and along Fourth Street from the east. Each of the descriptions offers a glimpse at what an observer might see while standing at each location, and how proper architectural lighting can enhance that vista.

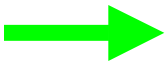
Some of the taller, more prominent buildings can be seen in various vistas of the city. They are mentioned in this section multiple times, where appropriate. When seen from different views, the buildings are situated in different contexts and take on various meanings and levels of importance to that vista.

VIEWPOINTS

LEGEND


From the Hill to Hill Bridge


From the Fahy Bridge


From Lehigh University


From St. Michael's Cemetery

Figure 4.1

FROM THE HILL TO HILL BRIDGE

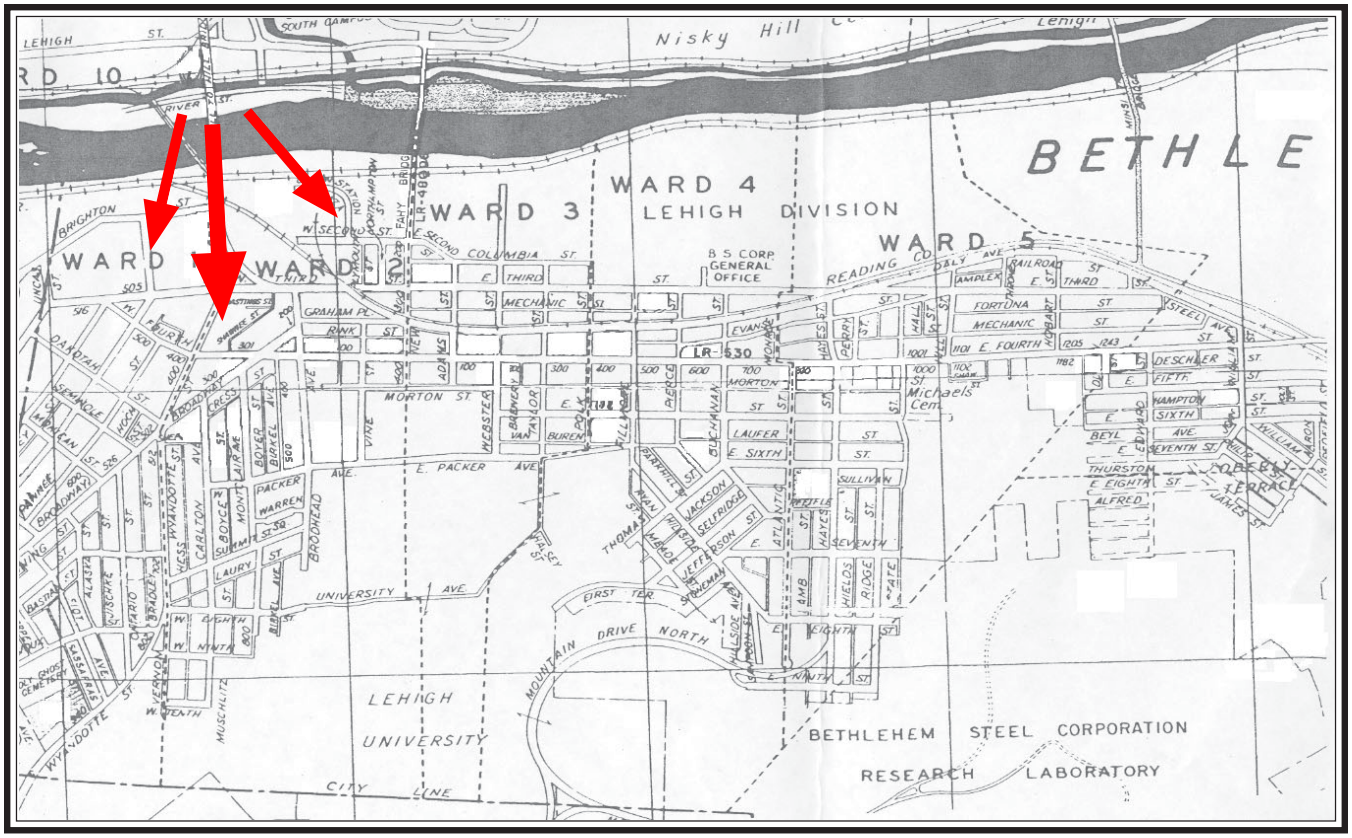


Figure 4.2

Coming into the city, visitors arrive at the bridge itself first. The lighting of the bridge should be distinctive, something to help persuade outsiders to get on the bridge and come across into South Bethlehem. The lighting scheme should be comfortable, not glaring; inviting, not offensive. Not only is the bridge used to draw visitors in, it is also a gateway to the city, and thus lends itself to giving an initial impression to all who pass under its steel girders.

Figure 4.3 *Rooney Building*

The size of this building sets it apart from its surroundings and establishes it as a landmark for the city. When seen from the Hill to Hill Bridge, this building acts as a point of reference, helping to orient visitors who are new to the city. Applying light to parts or all of the building would reinforce this role of orientation. However, due to the aesthetic nature of the building, intense illumination is not recommended.

Many of the University buildings can be seen from the Hill to Hill Bridge, scattered along the hillside. By highlighting some of the more architecturally significant campus buildings, a visual backdrop is created for nighttime viewing of South Bethlehem from afar. It enhances the vista and establishes the view as unique to the region, thereby giving more identity to the city.

Figure 4.4 *Lehigh University*

Figure 4.6

Once this building is renovated (scheduled completion in 2003), Union Station will be a major part of the view from the Hill to Hill Bridge. The highlighting of this building can be greater than that of the Sayre and Wilbur Mansions and the Lehigh Valley Railroad Building. A brighter building will help draw attention to the left of the bridge (as one enters the city), towards the city itself. One lighting concept might be to highlight the top edge of the building, which is the most visible part from the bridge.

Figure 4.5 *Union Station*

Figure 4.7 *Cathedral Church of the Nativity*

When entering town on the Hill to Hill Bridge, the Cathedral Church of the Nativity is directly in front of all drivers. A brightly lit church will help to further draw visitors across the bridge. It is the focal point at the end of the bridge, the exclamation point to what the bridge has been leading up to. This church has already had some exterior lighting installed.

Figure 4.8 *Sayre Mansion*

Figure 4.9 *Wilbur Mansions*

These buildings along the side of the bridge can be given soft highlights, nothing drastic. Like the Lehigh Valley Railroad Building, the lighting scheme should not distract visitors from viewing the rest of downtown. It should briefly draw attention to the buildings, but not have such overpowering brightness to be offensive. Illumination of these buildings will help create a visual border and better distinguish the downtown area. Proper illumination of these buildings and the Lehigh Valley Railroad Building is important to leave a favorable last impression in the minds of visitors leaving the city via the Hill to Hill Bridge.

Figure 4.10 *Lehigh Valley Railroad Building*

Coming across the Hill to Hill Bridge, the Lehigh Valley Railroad Building is the first major building one encounters. It is important to light this building so that a positive first impression of the city is given to visitors. The building requires a high quality lighting design accentuateing the subtle details of the structure with soft light so as not to district visitors from viewing the rest of town.

Figure 4.11

FROM THE FAHY BRIDGE

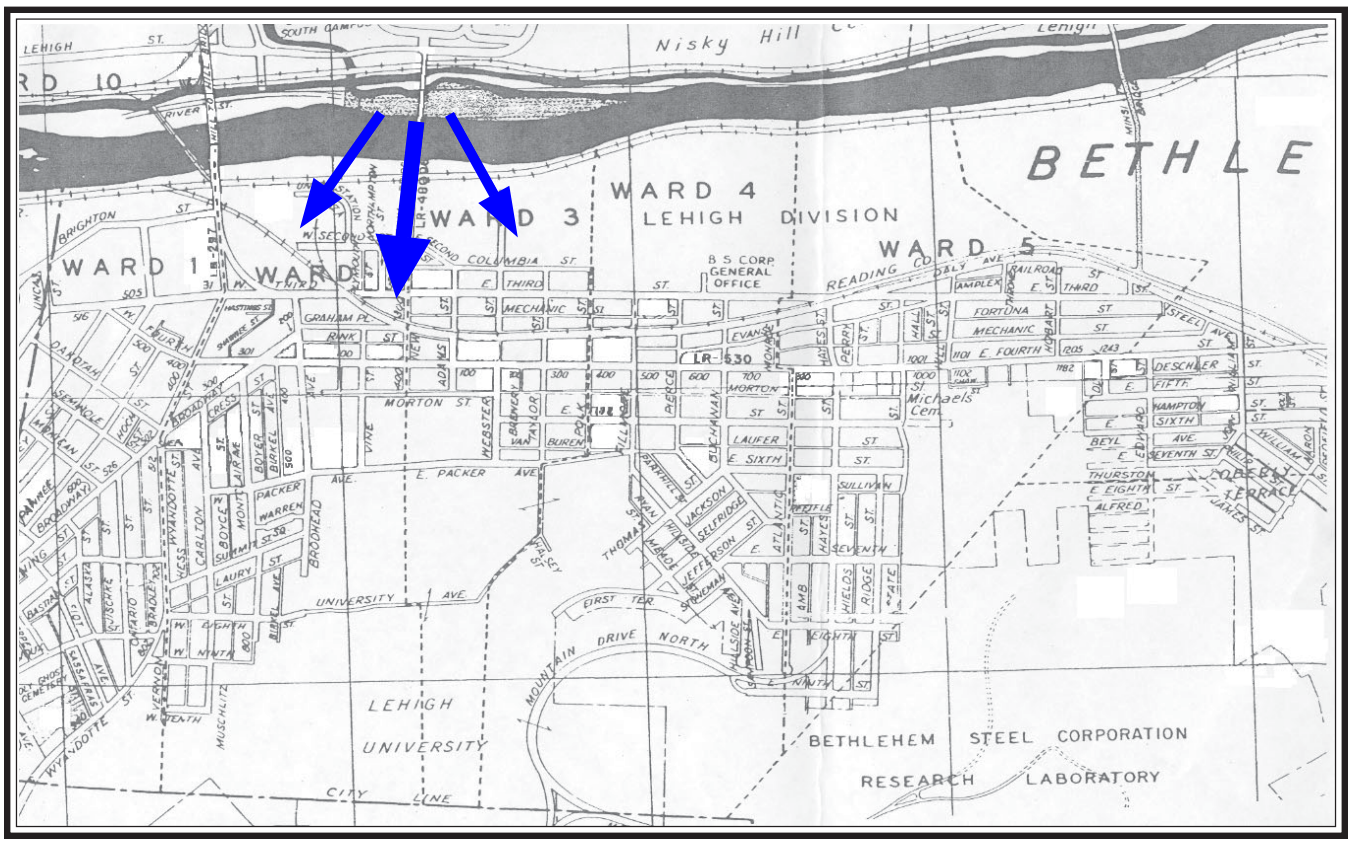


Figure 4.12

The Fahy Bridge is the major artery connecting the central downtown areas of North and South Bethlehem. Improving the nighttime view of the South Side from the Fahy Bridge may help entice people to cross the bridge from the north. The vista from the Fahy Bridge encompasses nearly all of the buildings on the South Side, so practically any facade lighting improvements that are made will be noticed from the bridge. As a major gateway to the South side, it is important to maintain an attractive view of the City from this location.

Driving across the bridge into the city, travelers will see the Rooney Building directly ahead of them. While it may not be the most architecturally or historically important building in the city, it is extremely prominent from this entrance to the city. Instead of highlighting the building itself, perhaps the flat, brick face of the façade could be used as a form of billboard to announce events and attract visitors from afar.

Figure 4.13 *Rooney Building*

Figure 4.14 *The Design Center*

While this building is not readily visible when coming over the bridge into the city, it is one of the last buildings visitors see on their way out of town. As such, it is important to use the building to provide a positive last impression on visitors. Highlighting elements on the front elevation can continue around the corner of the building to the elevation facing the bridge. The lighting will call attention to the building, and follow the visitors as they turn the corner and head across the bridge.

Figure 4.15 *Holy Infancy Church*

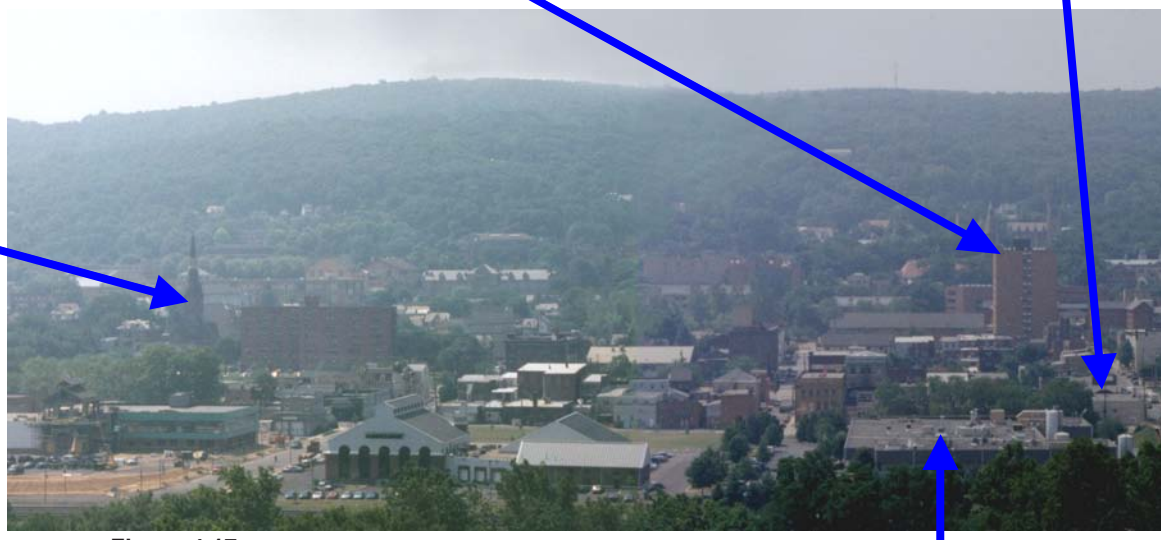


Figure 4.17

Looking towards the left of the bridge, observers can see the tall, narrow steeple of the Holy Infancy Church. Accentuation of this steeple with light will help signal this structure as a landmark not only from the bridge, but also from numerous locations all over the city. Highlighting of some of its lower architectural features will add to the building's streetscape presence.

Figure 4.16 *Beth Works*

When driving across the Fahy Bridge, the most prominent structure in an observer's immediate visual field is the Bethlehem Works property along the banks of the Lehigh River. In its current state, architectural lighting may not be appropriate for Bethlehem Works. However, with any future renovations, lighting should certainly be considered in order to properly display some of the most noticeable structures from this viewpoint.

Figure 4.18 *Broughal Middle School*

Figure 4.19 *St. Peter's Evangelical Lutheran Church*

These two buildings are more aesthetically pleasing than the Rooney Building, and nearly as visible. In contrast to the Rooney Building, the structures themselves could be illuminated to help set them apart and further define the skyline. Floodlighting of the faces of the buildings will especially draw attention to them from the viewpoint of the bridge.

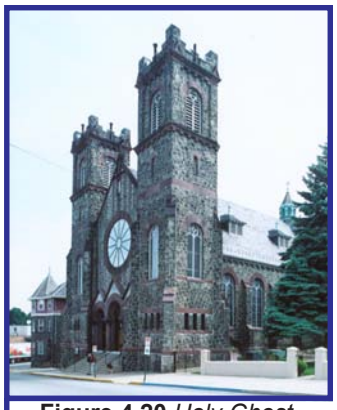


Figure 4.20 *Holy Ghost Church*

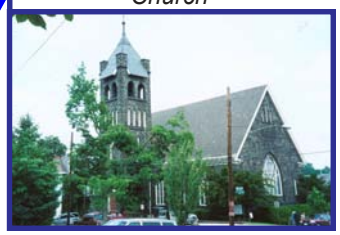
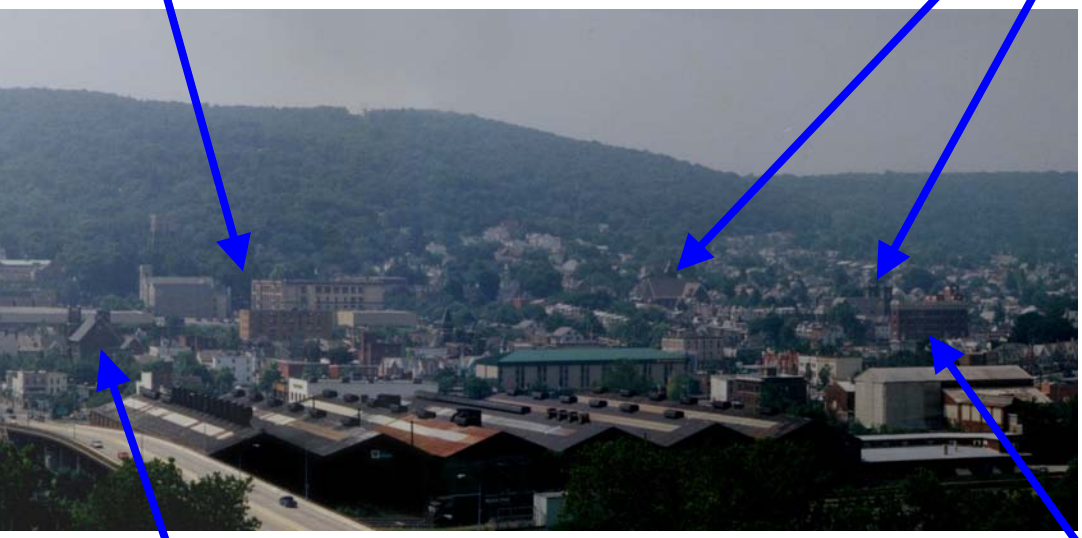


Figure 4.21 *Fritz Memorial United Methodist Church*

Near to the Flat Iron Building from the Fahy Bridge vista are these two prominent churches. While not overwhelmingly visible from the bridge, their presence could be increased by highlighting of the towers and rooflines. The lower parts of the structures not readily seen from the bridge could receive a softer light to help define the structures without being overpowering.



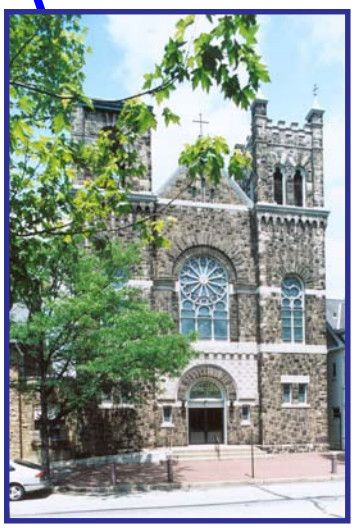


Figure 4-22 *First United Church of Christ*

While it is not as visually prominent as the Rooney Building, this church is certainly visible from the bridge. The twin towers of the church can be highlighted on all sides or silhouette lit from within to be seen from the Fahy Bridge view of the city; the front façade can be illuminated to enhance the building's streetscape presence.

Looking towards the right of the bridge, observers can notice the distinctive form of the Flat Iron Building. The highly visible face could be floodlighted to increase its visibility and the concrete crown of the building could be highlighted with color or at a higher illuminance level in order to make the building stand out even more.

Figure 4.23 *Flat Iron Building*

Figure 4.24

FROM LEHIGH UNIVERSITY CAMPUS

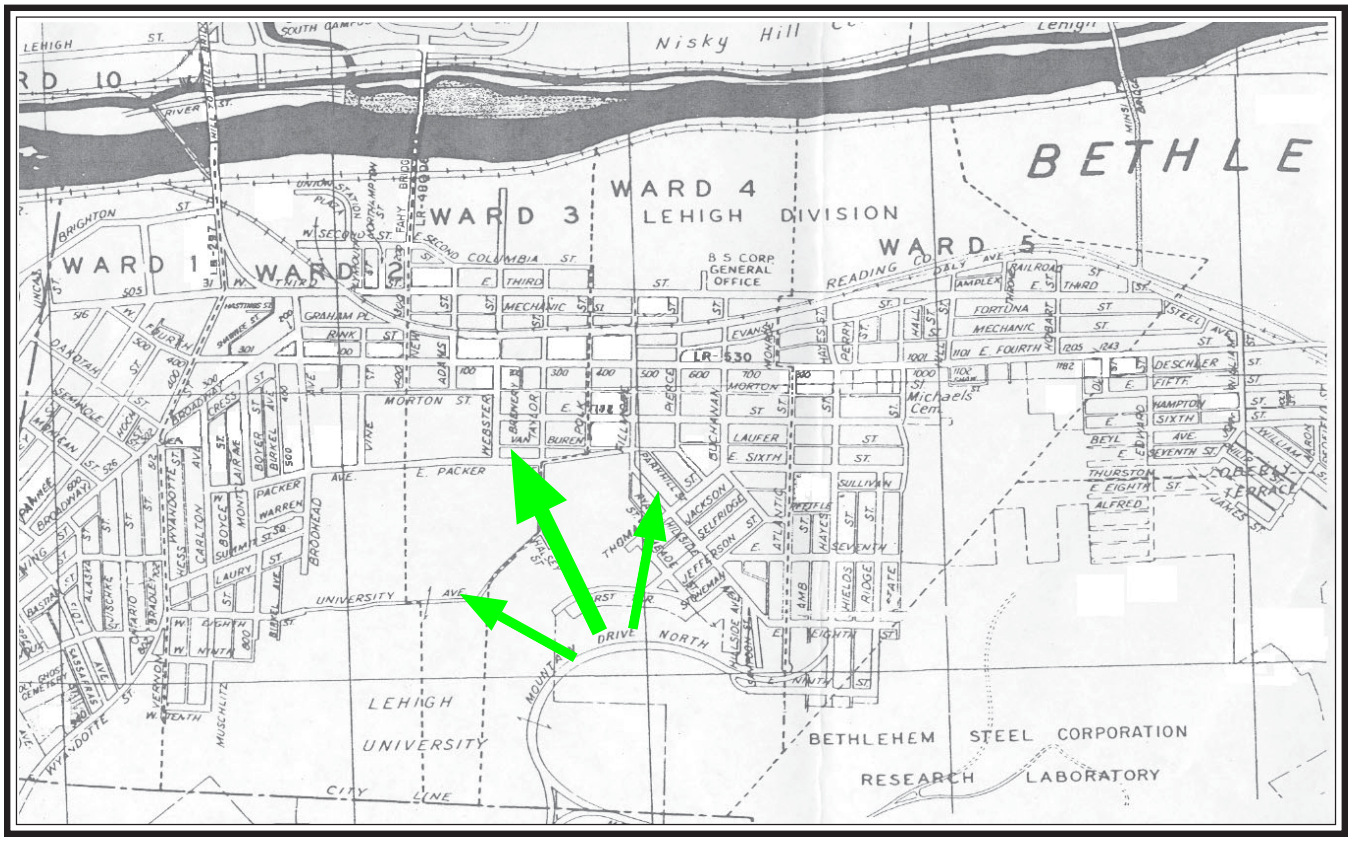


Figure 4.25

From many locations on campus, much of the view of South Bethlehem is blocked by trees. For this reason, the view of the city is better defined in cold weather months when tress have lost their leaves. At higher elevations, some buildings are visible year-round, particularly the upper parts of the buildings. Proper lighting of South Bethlehem's buildings, especially those on the town/gown border, will help attract the attention of University students, drawing them off campus into town.

Like the Hill to Hill Bridge, Union Station is very evident from higher elevations on the University campus. The lack of surrounding structures also helps make it stand out when seen from this viewpoint. Application of light to the front and top of the building will increase its nighttime presence. By illuminating the recently renovated structure, a greater awareness of local history is instilled in residents and visitors alike.

Figure 4.26 *Union Station*

These four neighboring buildings punctuate the south end of the Hill to Hill Bridge. These buildings are quite visible from the University viewpoint, and the highlighting of their façades and/or prominent architectural features will add to the overall aesthetic enjoyment of the city from this viewpoint.

Figure 4.27 *Lehigh Valley Railroad Building*

Figure 4.28 *Sayre Mansion*

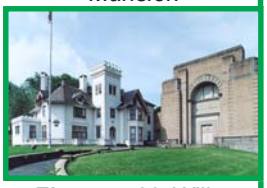


Figure 4.29 *Wilbur Mansion*

Figure 4.30 *Cathedral Church of the Nativity*

Figure 4.32

From certain locations on campus, the Flat Iron Building can easily be picked out of the cityscape. The building's long flat side faces the University and would be appropriate for illumination. The strong roofline also qualifies for highlighting, especially since it is particularly visible from the higher elevations of campus.

Figure 4.31 *Flat Iron Building*

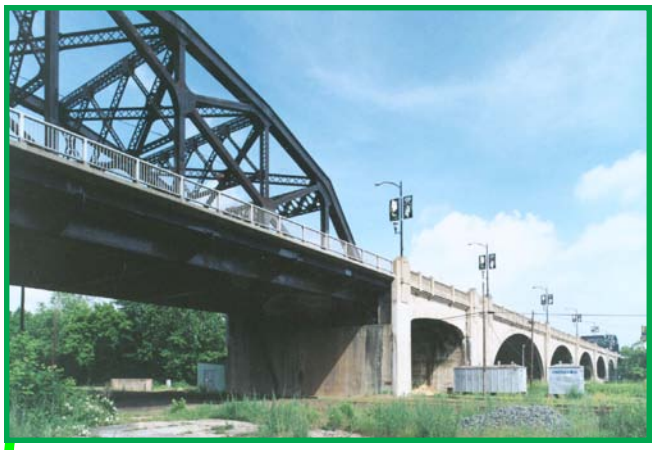


Figure 4.33 *Hill to Hill Bridge*

The length of this structure makes it a prominent part of the city skyline as seen from the upper elevations of the University. Any lighting of the structure of the bridge will help to further establish it as a landmark at night. From this viewpoint, properly lighting the bridge will not necessarily draw visitors into the city, but it may help improve the overall image of the city when seen from the University.

Figure 4.34 *Beth Works*

By virtue of sheer area, the buildings and equipment of Beth Works make it one of the most visible properties in all of South Bethlehem. There are many unique structural forms that would benefit from architectural highlighting. Lighting selected items from the Beth Works property will help draw attention to the source from which the city drew its livelihood for many years.

Figure 4.35 *Rooney Building*

From the upper elevations of the Lehigh University campus, the Rooney Building can be seen towering over many of the smaller buildings downtown. Especially noticeable from here is the top of the building. Because of its deep setback from the edge of the building, the penthouse area on the roof could be highlighted in such a manner that it would be seen only from high elevations. Unnecessary attention wouldn't be drawn to an architecturally indistinct building, yet it would provide some visual variety to the University vista.

Figure 4.36

FROM ST. MICHAEL'S CEMETERY

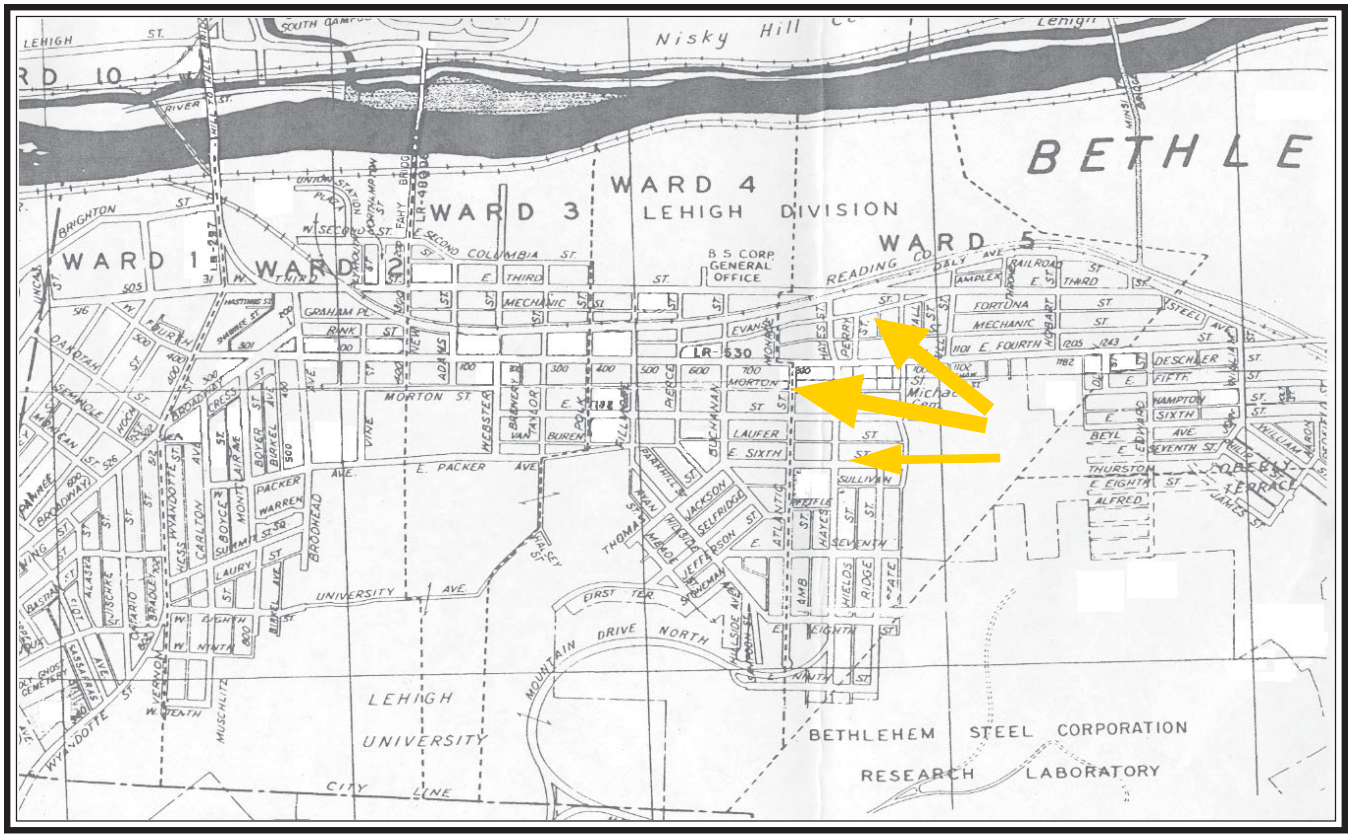


Figure 4.37

People entering South Bethlehem from the east along Fourth Street encounter St. Michael's Cemetery on the outskirts of the city. The high elevation and few visual obstructions of the cemetery offer a dramatic view of a large portion of South Bethlehem. This area of the city has an especially high population of religious structures. The architectural and ecclesiastical heritage of the neighborhood can be reinforced through the highlighting of certain features of these churches.

The tall, narrow steeple of the Holy Infancy Church distinguishes the church from among the others seen from this viewpoint. Highlighting this steeple is important not only for recognition of the Church, but also as a landmark for orientation at night. The steeple can be seen from many locations in the city, and illuminating it will aid visitors and residents alike in determining where in the city they are located.

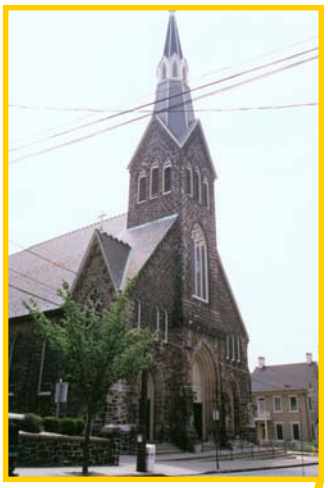


Figure 4.39 *Holy Infancy Church*

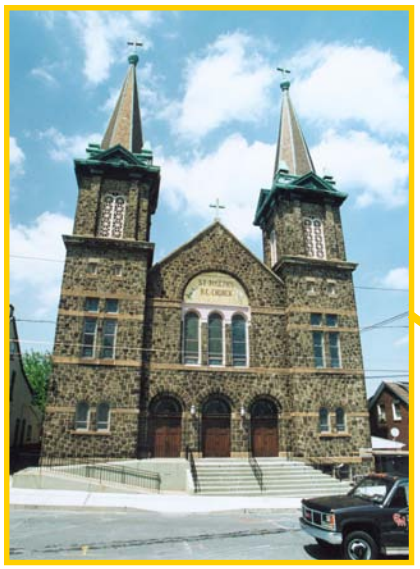


Figure 4.40 *St. Joseph's Church*

St. Joseph's Church can easily be identified from this viewpoint due to its twin steeples; it is the only church with that characteristic. Lighting these steeples will continue this recognition into the night. Additional lighting of the stained glass windows or the stone façade could be applied to enhance the church's nighttime streetscape presence.

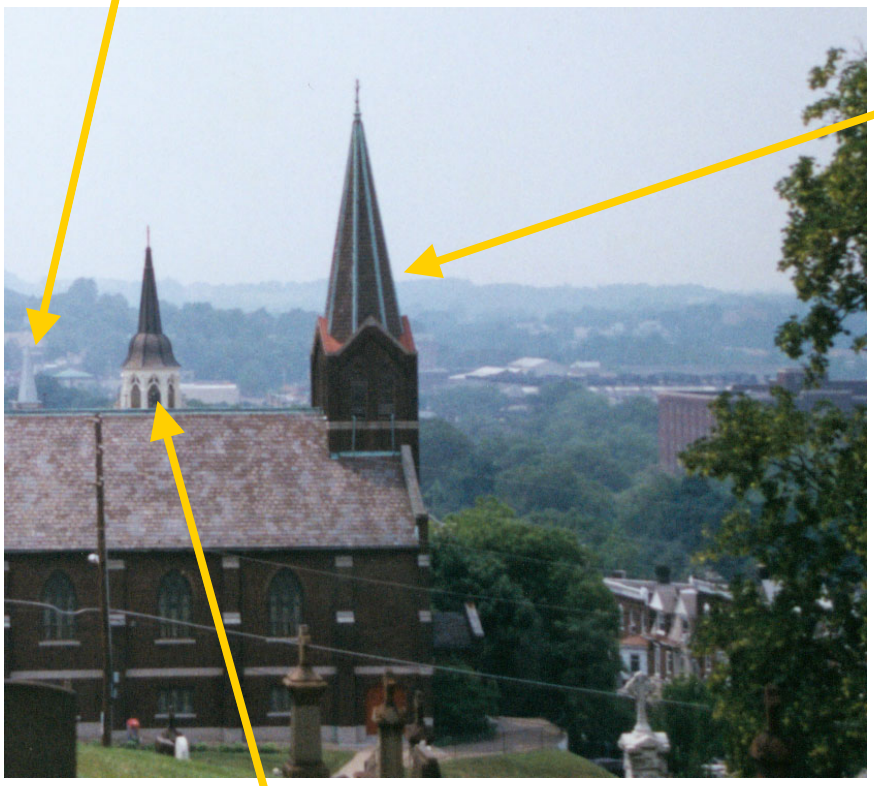
Figure 4.41

As occurs in all of the other vistas of the city, the Rooney Building is quite visible from St. Michael's Cemetery. And like the steeples of the churches along Fourth Street, illuminating the Rooney Building will further establish it as a landmark. Although lighting the façade of this building may not improve the aesthetics of the city skyline, it would help provide orientation at night.

Figure 4.40 *Rooney Building*

The St. John's Windish Lutheran Church towers above its neighbors on a relatively empty part of Fourth Street. Lighting up the steeple would help reinforce its skyline presence at night. By illuminating the unique color of the steeple it has, people can easily identify it as belonging to the St. John's Windish Lutheran Church from. Softly lighting some of the low level features of the building would improve it's streetscape appearance.

Figure 4.42 *St. John's Windish Lutheran Church*



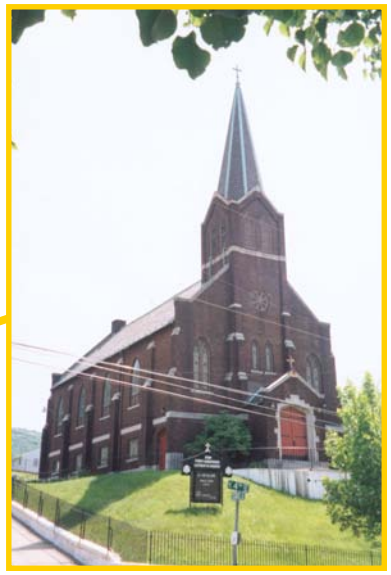


Figure 4.43 *Zion Hungarian Lutheran Church*

Located adjacent to the cemetery, the Zion Hungarian Lutheran Church is the most prominent of the churches seen from this viewpoint. It is the first church seen when entering town along Fourth Street. The eastern side, which faces the cemetery, and the steeple could be highlighted to give a favorable initial impression to visitors.

St. John's Capistrano Church has a number of architectural details that would benefit from concentrated lighting. Highlighting these elements would enhance the overall streetscape presence of the church on Fourth Street. Illumination of the steeple and bell tower signifies the location of the church from farther distances.

Figure 4.44 *St. John's Capistrano Church*

CHAPTER 5

A LIGHTING PLAN

Lighting Concepts for Individual Buildings

Numerous buildings and structures in South Bethlehem can benefit from architectural highlighting. The following pages represent only a few of these structures, ones that were chosen because of their potential to represent various lighting techniques. The first five structures were selected to show a wide variety of building types with specific cultural, historical, social, or economic importance, as well as scale and location.

Map 5.1 identifies the possible candidates that were considered for architectural highlighting in this study. **It is stressed that this list is not intended to be all inclusive, and owners of structures not included in this list are strongly encouraged to participate in the lighting initiative.**

Listed with each description are two costs, installation and operation. Installation is a very rough idea of the potential cost incurred in installing the proposed design. This cost includes equipment, wiring, controls, and mounting. It assumes that ample power is available and relatively easily accessible. Operational costs are based on an estimated annual usage of operating the lighting system 8 hours per day, 365 days per year at $0.08 per kilowatt hour. The operational costs include routine maintenance assuming the owner does the labor and the system's life expectancy is about 20 years.

A 100 watt incandescent lamp operated 8 hours per day, 365 days a year at $0.08 per kilowatt hour costs $23.36 to operate. Based on an average life of 750 hours, replacement cost of $0.50 per lamp and including minimal labor charges, the average cost per year to operate and maintain a 100 watt lamp is approximately $35.00. Use this to keep the costs in the following section in perspective.

LEGEND

BUILDINGS LISTED IN NO PARTICULAR ORDER

1. St. John's Zion AME Church
2. Bethlehem Spanish Pentecostal Church
3. Ale House
4. Holy Ghost Church
5. Holy Infancy School
6. Flat Iron Building
7. Sayre Mansion
8. Wilbur Mansion
9. Lehigh Valley Railroad Building
10. Hill to Hill Bridge
11. Union Station
12. Tally Ho
13. Post Office
14. First Hispanic Baptist Evangelical Church
15. Fritz Memorial United Methodist Church
16. Broughal Middle School
17. St. Peter's Evangelical Lutheran Church
18. Rooney House
19. First United Church of Christ
20. Banana Factory
21. Fahy Bridge
22. Design Center
23. Fleet Bank
24. Holy Infancy Church
25. South Bethlehem Library
26. Protection Firehouse (Touchstone)
27. (not used)
28. Union Bank Building
29. St. John's Windish Lutheran Church
30. St. Joseph's Church
31. SS Cyril and Methodius Church
32. Our Lady of Pompeii Church
33. St. John's Capistrano Church
34. St. Stanislaus Church
*35. Zion Hungarian Lutheran Church
*36. Holy Bethel Pentecostal Church
*37. Concordia Lutheran Church
38. (not used)
*39. Beth Works crane
*40. PB & NE Railroad Building
41. (not used)
42. Holy Ghost Preschool

**This structure is located to the east of the eastern edge of the map, and is therefore not shown on the map.*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SCALE 1" = 100'


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COLUMBIA ST
E THIRD ST
DALY AVE
EVANS ST
E FOURTH ST
E FIFTH ST
E SIXTH ST
E SEVENTH ST
E EIGHTH ST
VAN BUREN ST
E PACKER AVE
FILLMORE ST
PIERCE ST
BUCHANAN ST
ATLANTIC ST
HAYES ST
THOMAS ST
HILLSIDE AVE
TAYLOR ST
WEBSTER ST
FIRST TER

Flat Iron Building

A unique structure that stands proudly at the intersection of Fourth and Broadway, this landmark building could be as identifiable at night as during the day. The upper level of the building should be floodlighted with small, high power spotlights to wash the columns and light the cornice (floodlighting). The lower level of the building can be illuminated with bounce light from the trees, which should be uplighted.

Techniques used - grazing floodlight, landscape lighting.

Installation: $15,000 – $25,000
Operation: $1,200 – $1,600

Figure 5.1 *photo*

Figure 5.3 *Photo Rendering*

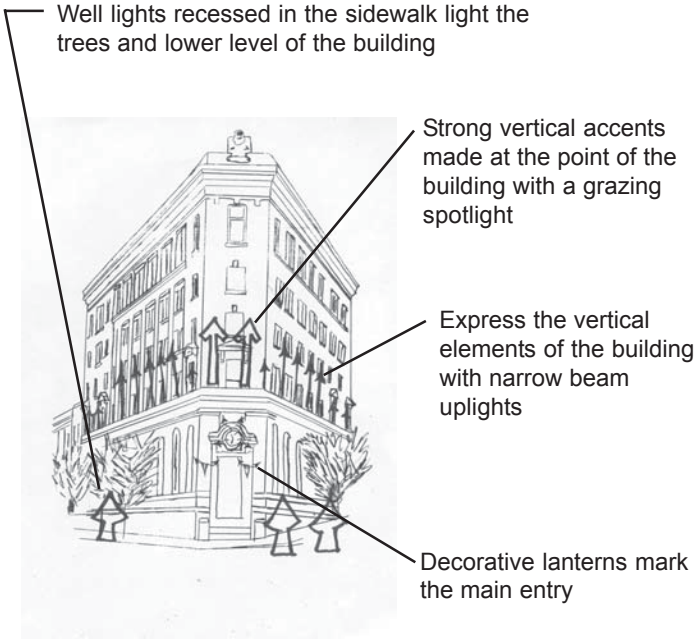

Figure 5.2 *Building Sketch*

Holy Infancy Church

Visible from all over the South Side of Bethlehem, the Holy Infancy Church steeple is a perfect example of a structure that can be used for orientation. The steeple should be floodlighted with powerful spotlights mounted on nearby utility or street light poles (floodlighting). The stained glass, currently backlighted, could have its source switched to a lamp with a cool color to accent the blue hues in the glass (transmitted luminance). The street level wallpack fixtures at the main entry should be replaced with decorative lanterns to give a solid street level presence to the church and welcome the visitors.

Techniques used - floodlighting, transmitted luminance.

Figure 5.4 *Photo*

Installation: $5,000 – $15,000
Operation: $600 – $1,000

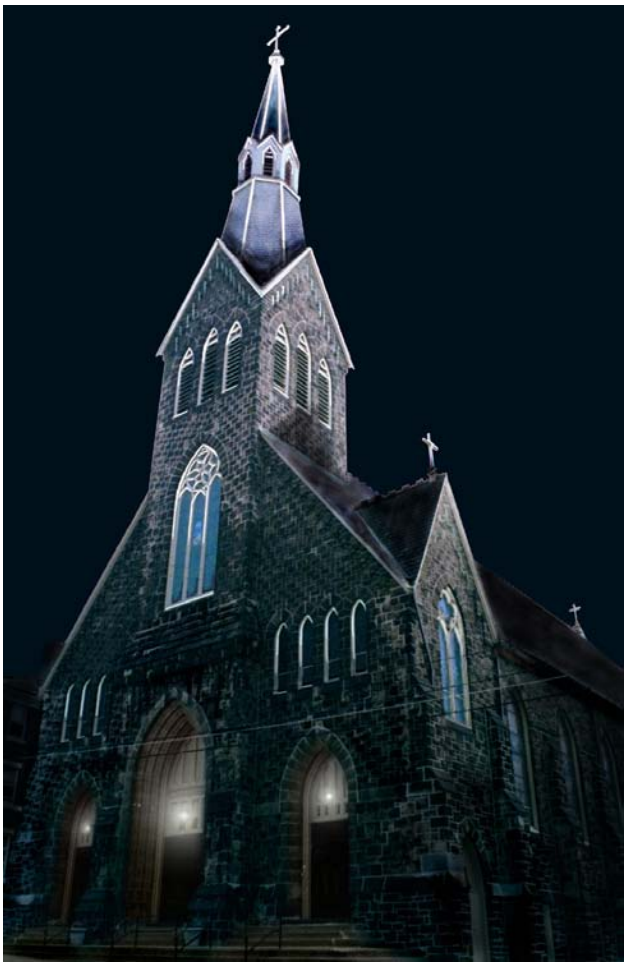

Figure 5.6 *Photo Rendering*

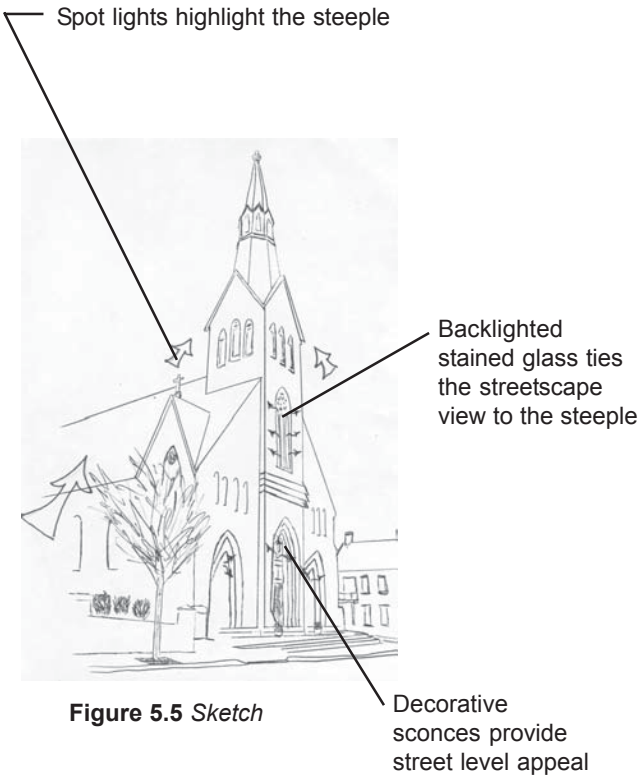

Figure 5.5 *Sketch*

Holy Ghost Church

Figure 5.7 *Photo*

The massive twin towers of this church would be best accented by a grazing floodlight (floodlighting). This would provide a dramatic effect at night as the full texture of the stone is revealed. Additional floodlights should be focused on the cross and the center of the church. Further, the top of the towers need to be illuminated with a soft, supplemental light from a spotlight on a nearby utility pole. The stained glass window should be backlighted (transmitted luminance) and the entry lights should be replaced or properly maintained (ornamental).

Techniques used - floodlighting, transmitted luminance, ornamental.

Installation: $18,000 – $30,000
Operation: $1,500 – $1,600

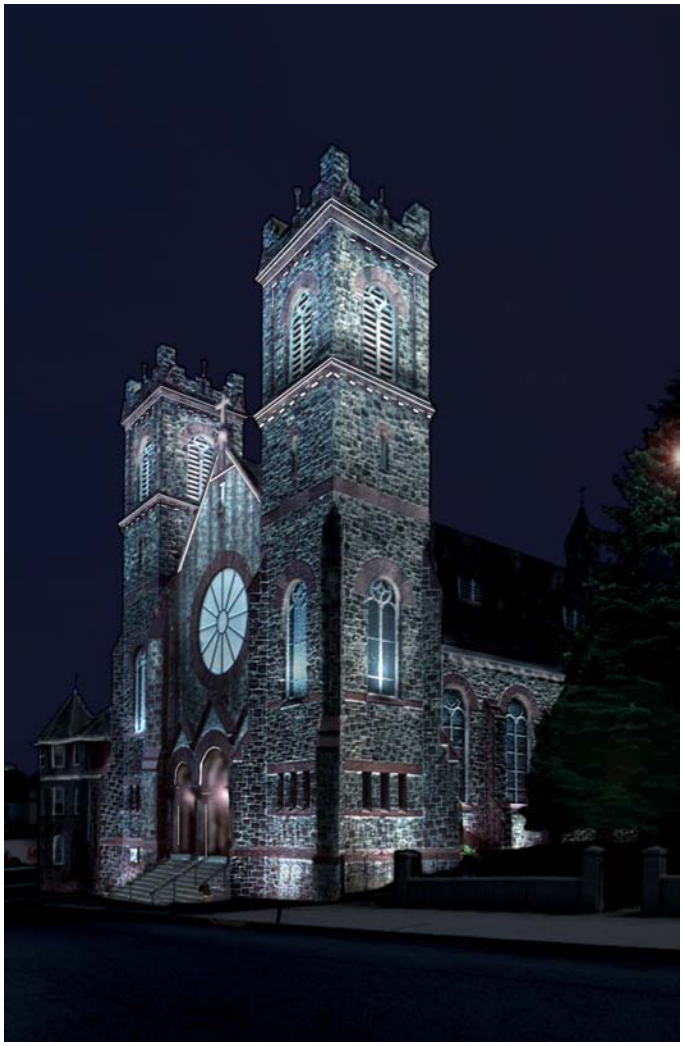

Figure 5.9 *Photo Rendering*

Figure 5.8 *Building Sketch*

Design Center

With a prominent location in the center of the South Side of Bethlehem, the highly detailed, low scale, pedestrian-friendly Design Center welcomes travelers as they exit the Fahy Bridge. The ornate cornice work along Third Street should be highlighted by a concealed linear source with a warm color tone (mix of floodlighting and linear). The strong columns, which accent the facade, should be gently washed with lights that are recesed in the ground and concealed by the large planters on the sidewalk. For added flair, color filters could be added to the recessed well lights (floodlighting). The store owners should also be encouraged to keep display lighting on into the evening hours to promote window shopping and add depth to the building (transmitted luminance).

Techniques used - floodlighting, transmitted luminance.

Installation: $8,000 – $15,000
Operation: $450 – $800

Figure 5.10 *Photo*

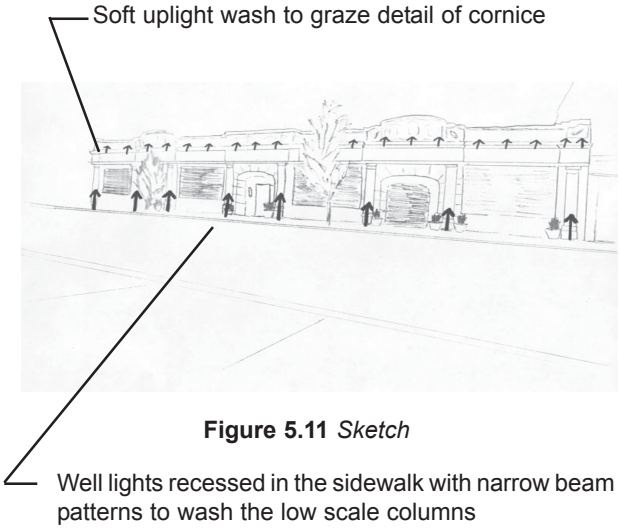

Figure 5.11 *Sketch*

Figure 5.12 *Photo Rendering*

Hill to Hill Bridge

The Hill to Hill Bridge acts as a major gateway to the South Side of Bethlehem. As such, the bridge should be fully lighted to accent its history and features. Outlining the main iron structure of the bridge with point sources of light allows the structure to be visible from great distances (loci lighting). This also provides a comfortable and even illumination for pedestrians on that section of the bridge. The new gas light style pedestrian fixture is a good addition, but needs to be carried further to eliminate/replace the cobra head street light fixtures that loom over the bridge (decorative). Lighting the underarches of the bridge would further enhance the nighttime appearance of the bridge (floodlighting).

Techniques used - loci, decorative, floodlighting.

Installation: $20,000 – $120,000
Operation: $2,000 – $8,000

Figure 5.13 *Photo*

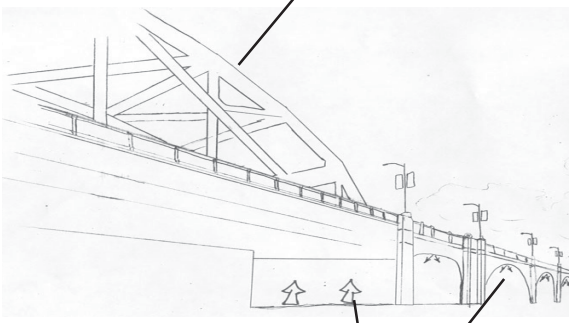

Figure 5.14 *Sketch*

Figure 5.15 *Photo Rendering*

Zion Hungarian

Figure 5.16 *Sketch*

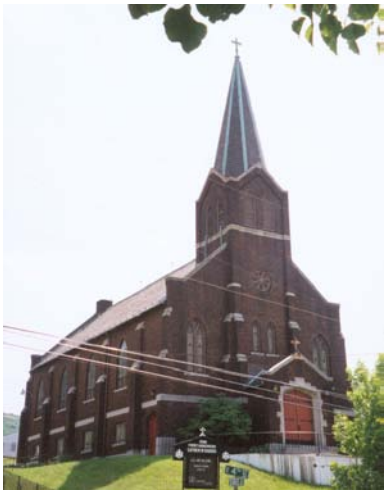

Figure 5.17 *Photo*

This landmark church stands alone beside St. Michael's Cemetary as an entry to the South Side on Fourth Street. A bold statement could be made by floodlighting the steeple and washing the the front facade of the church (floodlighting). The floodlighting of the front facade should be secondary to the steeple to help draw the viewers' eyes upward. Softly floodlighting the side of the church would help ground the steeple and draw attention to the unique visiblity of the entire church. Backlighting the small, round stained glass window (transmitted luminance) and installing decorative lanterns on each side of the front entry doors (decorative) would add needed sparkle to the night apperance.

Techniques used - transmitted luminance, floodlighting, decorative.

Installation: $8,000 – $16,000
Operation: $400 – $600

Lehigh Valley Railroad Building

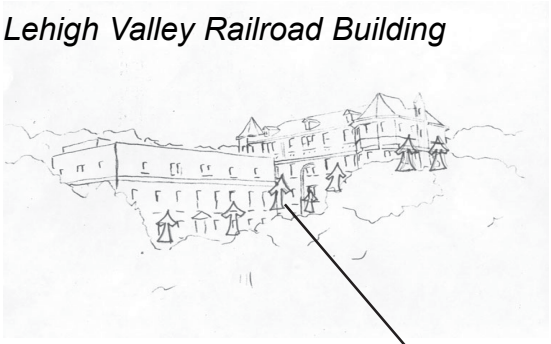

Figure 5.18 *Sketch*

Figure 5.19 *Photo*

Upon entering the South Side on the Hill to Hill Bridge, the Lehigh Valley Railroad Building is one of the first major structures to become visible. The facade should be loosely grazed with a floodlight (floodlighting). The intent is to graze the structure enough to show off the ornate cornice and brick reliefs at the windows without modeling the texture of the brick too heavily. Keeping the lights close to the building will also help prevent glare from entering the windows. The lighting of this building must be clear, but not overpowering, so that it leads visitors into town, then quickly becomes secondary to more prominent structures further in town.

Techniques used - grazing floodlight.

Installation: $16,000 – $24,000
Operation: $1,500 – $2,000

Beth Works Crane

Figure 5.20 *Photo*

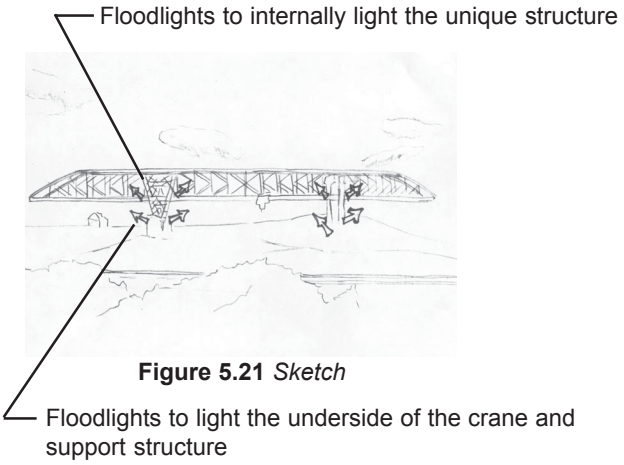

Figure 5.21 *Sketch*

The Beth Works crane is one of many Beth Works structures deserving of preservation and highlighting at night. The simple addition of 8 to 16 floodlights could turn this magnificant structure into a piece of community history day and night (floodlighting). The crane could quickly become a symbol that you are entering or exiting South Bethlehem, as well as a directional landmark. Other Beth Works structures that could be highlighted with great success include: the Foundry, Blast Furnace, Smoke Stacks, GSO Office Building, and Bank Building. A seperate study is recommended to mesh these structures into the masterplan.

Techniques used - floodlighting.

Installation: $6,000 – $15,000
Operation: $550 – $800

St. Joseph's Church

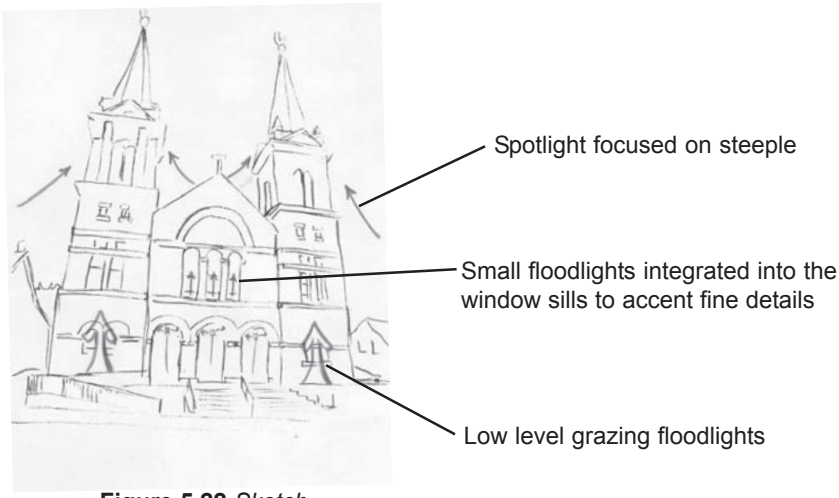

Figure 5.22 *Sketch*

Figure 5.23 *Photo*

Selective floodlighting many of the fine details of this church would give it a strong nighttime presence (selective floodlighting). Small floodlights integrated at ground level and various window and vent elevations can highlight the beautiful details of the structure while leading the eye upward to the twin steeples. The twin steeples should be floodlighted; this may need to be done from nearby utility poles or with permission from adjacent structures (floodlighting). The intensity of the steeple should be greater than the church's own facade but not so bright that it dominates the surroundings.

Techniques used - floodlighting, selective floodlighting.

Installation: $8,000 – $20,000
Operation: $600 – $900

Fleet Bank

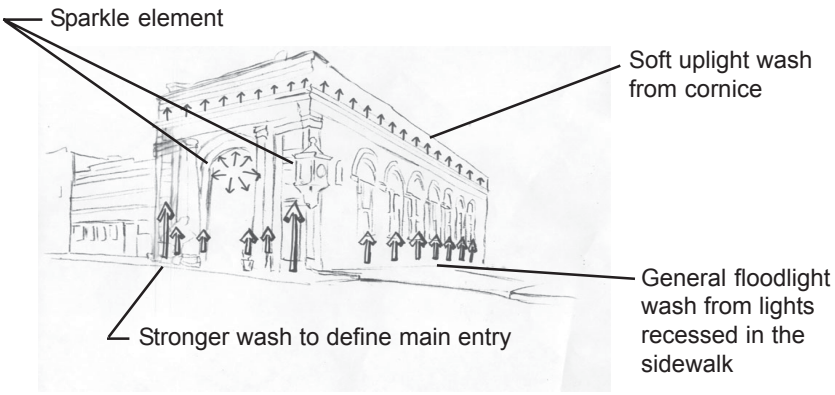

Figure 5.24 *Sketch*

Figure 5.25 *Photo*

The low scale, pedestrian friendly, gothic design of the Fleet Bank Building needs lighting that responds to its scale and place in town. A gentle wash of light provided around the perimeter of the structure would help draw attention to the simple, stately design as well as provide added security (floodlighting). The intensity should be slightly higher at the Third Street facade to signify the main entry. All lights should be recessed flush in the ground to avoid being visible during the day. Small lights added behind the large colomns at the main entry could add visual interest by placing the columns in silhouette (silhouette). Additional sparkle and street level appeal could be added by refurbishing the clock and/or adding a decorative pendant in the front entry alcove (decorative).

Techniques used - floodlighting, silhouette, decorative.

Installation: $8,000 – $20,000
Operation: $400 – $600

Wilbur Mansion

Figure 5.26 *Photo*

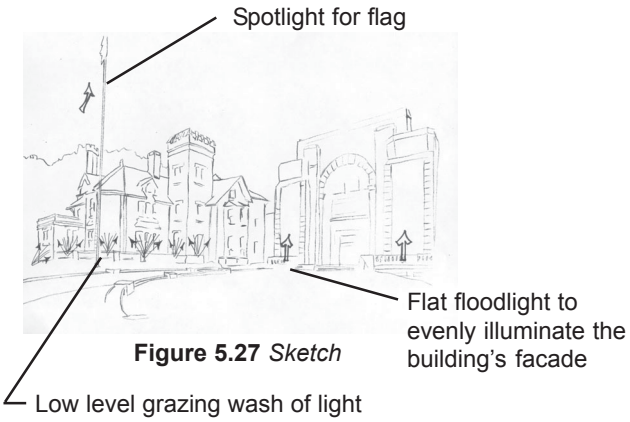

Figure 5.27 *Sketch*

Just past the Lehigh Valley Railroad Building is the Wilbur Mansion. Low-level, soft grazing of the white structure will easily make this building a standout feature, marking arrival to the South Side (floodlighting). The lighting must be placed close enough to the structure to prevent glare inside the building and to render the offest block structure. Care must be taken not to place the lighting too close to the wall, or the exageration of the texture will feel unnatural. The masonic temple requires two simple flatter-angled floodlights. The soft grazing of the Mansion will relate to the other neighboring buildings, and the slightly flatter-angled wash on the Masonic temple will set it apart slightly.

Techniques used - floodlighting.

Installation: $2,000 – $16,000
Operation: $600 – $800

St. John's Zion AME Church

Figure 5-28

This unique church could be highlighted with a small, low wattage floodlight on either side of the front entrance, just under the reveals. This would help to accentuate the natural stone façade by grazing the surface (grazing floodlight). A small spotlight mounted on the interior would best serve the stained glass window. This fixture would utilize a lamp with a high color temperature to enhance the blue hues of the window (transmitted luminance). Replacing the wall-mounted fixture above the front door with a more decorative fixture would greatly add to the inviting look that is desired (ornamental).

Techniques used - grazing floodlight, transmited luminance, ornamental.

Installation: $900 – $1,100
Operation: $75 – $100

Bethlehem Spanish Pentecostal Church

Figure 5-29

The stone cross in the steeple's front façade could be best highlighted by a small spotlight mounted on the roof of the canopy at the front door (selective floodlighting). Replacing the light fixture above the sign with a linear fluorescent fixture will wash the sign in a more even light, and bring more attention to it.

Techniques used - selective floodlighting.

Installation: $500 – $800
Operation: $40 – $60

Ale House

Figure 5-30

The lighting for this building would be best incorporated into a restoration or renovation of the structure. Lighting could play a big part in emphasizing a new or restored building on this site, as it is a pivotal intersection into South Bethlehem.

Techniques used - Based on the site's shape and location within the city, a future lighting scheme of floodlighting combined with delineation could work well.

Installation: ?
Operation: ?

Holy Infancy School

Figure 5-31

Two spotlights mounted on either side on the roof from below could highlight the cross, high above the main entrance on the front façade (selective floodlighting). Semidecorative fixtures mounted inside the portico (entry) would provide an inviting feel to the street level entry (silhoutte).

Techniques used - selective floodlighting, silhouette.

Installation: $1,000 – $3,200
Operation: $250 – $350

Sayre Mansion

Figure 5-32

Attention can be brought to the prominent, hexagonal part of the building to the left of the front entrance by ground level floodlights (floodlighting). These floodlights would wash the brick façade and emphasize the intricate brick detailing (grazing). By uplighting various trees around the property with ground level floodlights, an inviting look could be added to the grounds all through the year. Light levels should be consistant with the neighboring Wilbur Mansion.

Techniques used - floodlighting, grazing.

Installation: $2,500 – $7,000
Operation: $250 – $600

Union Station

Figure 5-33

Architectural lighting elements will play an important role in the personality of this building as a rehabilitation effort is made. Possible techniques to be used in conjunction with the restoration are silhouette lighting of the main columns at the entry and selective floodlighting and grazing of the buildings details.

Techniques used - silhouette, selective floodlighting, grazing floodlight.

Installation: ?
Operation: ?

Tally Ho

Figure 5-34

Floodlight fixtures, mounted just above the overhang to either side of the main entrance would light up the entire front façade of this building and even give the very decorative brick detailing at the roof line much needed attention (floodlighting). At the back of the building, just above the porch roof, a small spotlight could be used to graze up the wall, catching the “Tally Ho” lettering, bringing it to life (grazing floodlight). A decorative “lantern” style light fixture could be added to the outside of the white columns along the porch/deck (ornamental). This would give a warm and inviting glow to a popular spot.

Techniques used - selective floodlighting, grazing floodlight, and ornamental.

Installation: $3,500 – $8,000
Operation: $400 – $700

Post Office

Figure 5-35

In-grade well lights and either building mounted or ground level spot/flood lights could be used to highlight the columns, corinthian capitols, dental work, and ornate cornice (selective floodlighting). This building is used by many people in their day-to-day lives and possesses a classic style of architecture worthy of attention to its detail. All lighting should be soft accents, not too bright.

Techniques used - selective floodlighting.

Installation: $3,000 – $10,000
Operation: $250 – $500

First Hispanic Baptist Evangelical Church

Figure 5-36

From the exterior, the impressive stained glass windows could benefit from small spotlights mounted on the interior of the church. This fixture type would utilize a lamp with a high color temperature to accentuate the blue hues of the glass (transmitted luminance). Bringing these windows to life at night would play an important role in the streetscape image of the church. In addition to the windows, the steeple, with its unique architectural features, would benefit from building mounted flood lights.

Techniques used - transmitted luminance, selective floodlighting.

Installation: $2,000 – $4,500
Operation: $250 – $450

Fritz Memorial United Methodist Church

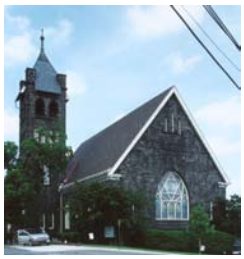

Figure 5-37

Wall washing floodlights to highlight the stone facades would best complement this church (floodlighting). The stained glass windows could be emphasized by mounting a small spotlight on the interior to backlight the glass for viewing from outside (transmitted luminance). The tower could be internally illuminated to give a unique look to the steeple (silhouette).

Techniques used - transmitted luminance, floodlighting, silhouette.

Installation: $2,000 – $5,000
Operation: $200 – $500

Broughal Middle School

Figure 5-38

The light at the school's sign should be replaced with a more efficient, less obtrusive style of fixture. Small wall mounted floodlights could be used to accent the building's vertical columns (selective floodlighting). The basic wall sconces at the entrances should also be replaced with a decorative fixture, a "lantern" style fixture being an example (ornamental). This would greatly add to the rich architecture of the building.

Techniques used - ornamental and selective floodlighting.

Installation: $8,000 – $12,000
Operation: $500 – $900

St. Peter's Evangelical Lutheran Church

Figure 5-39

Wall washing floodlights to highlight the stone facades would best compliment this church (floodlighting). The stained glass windows could be emphasized by mounting a small spotlight on the interior to backlight the glass for viewing from outside (transmitted luminance). The tower could be internally illuminated to give a unique look to the steeple (silhouette).

Techniques used - transmitted luminance, floodlighting, silhouette.

Installation: $3,000 – $6,000
Operation: $300 – $600

Rooney House

Figure 5-40

Possibly use the flat brick face that is highly visible from North Bethlehem as a decorative canvas on which city functions and seasonal greetings can be displayed (ornamental). A few high-wattage, projector style light fixtures can easily achieve this effect from a nearby roof. It is not necessary for this building to be lighted in this manner every evening, but perhaps only on special occasions.

Techniques used - ornamental.

Installation: $4,000 – $10,000
Operation: $300 – $600

First United Church of Christ

Figure 5-41

On the front façade, a small spotlight mounted on the interior would best highlight the stained glass windows (transmitted luminance). These fixtures would utilize a lamp with a high color temperature to accentuate the blue hues of the glass. The tower could be internally illuminated to give a unique look to the twin towers (silhouette). The decorative wall mounted lanterns beside the main entry could be refurbished to provide an inviting entry (ornamental).

Techniques used - transmitted luminance, silhouette, ornamental.

Installation: $1,000 – $3,000
Operation: $150 – $250

Banana Factory

Figure 5-42

This building, being an arts and education center, would be an ideal place to utilize some creative lighting techniques. Neon tubing or fiber optics could help to pronounce the abstract wall lines on the lower portion (ornamental). In addition, neon tubing or side glow fiber optics could outline the building to accentuate the crisp lines of the architecture (delineation).

Techniques used - delineation, ornamental.

Installation: $5,000 – $20,000
Operation: $500 – $1,000

South Bethlehem Library

Figure 5-43

Spotlights mounted to nearby utility poles could be used to highlight the building name above the two entrances (selective floodlighting). Semi-decorative wall sconces could be added to draw attention to this important public building at night and give it a strong street level presence (ornamental). All lighting should be soft and warm.

Techniques used - ornamental, selective floodlighting.

Installation: $500 – $2,500
Operation: $50 – $250

Fahy Bridge

Figure 5-44

As this bridge is a major artery to and from the city of South Bethlehem, it is strongly recommended that the existing "cobra head" light fixtures and poles be replaced with a more aesthetically pleasing light standard. A decorative light fixture can include improved optics and light distribution for better visibility along the bridge (ornamental). Highlighting the architecture of the underside of the bridge could also play an important role in the personality of this structure. Simply floodlighting the underside and supports could emphasize this personality. For a more modern, creative approach, color washing the bridge's underbelly could be done (floodlighting). To achieve the best color washing effect, the bridge should be painted in a light color for proper reflectivity. A second approach could be outlining the structural shape with side-glow fiber optics to change colors and simply define the structure (delineation).

Techniques used - ornamental, floodlighting, and delineation.

Installation: $25,000 – $100,000
Operation: $500 – $3,500

Protection Fire House (Touchstone)

Figure 5-45

Replacing the standard utility light fixtures above the Touchstone Café awning with more decorative fixtures would add visual interest to the storefront and create an inviting atmosphere. The wall-mounted fixtures on either side of the main theater entrance could be replaced with a decorative fixture that would add sparkle to the front façade, inviting guests inside (ornamental). In addition, a linear fluorescent fixture for an even wash of light could highlight the theater sign above the front doors. Outlining the top of the building with small point sources would give the theater more street presence and could rimind patrons of the make-up lights used inside the theater (loci).

Techniques used - ornamental and linear.

Installation: $2,500 – $3,500
Operation: $250 – $500

Union Bank Building (Beth Works)

Figure 5-46

Linear fluorescent or cold cathode strip fixtures could be mounted to the top of the cornice. This would bring attention to the unique architecture that runs along the entire top of the building (linear). All lighting should be soft.

Techniques used - linear.

Installation: $2,000 – $4,000
Operation: $250 – $500

Our Lady of Pompeii Church

Figure 5-47

Replace the existing utility fixture at the main entrance with decorative fixture. This would add a pleasing visual element to the entrance and create an inviting atmosphere (ornamental).

Techniques used - ornamental.

Installation: $400 – $600
Operation: $100 – $150

St. John's Windish Lutheran Church

Figure 5-48

Since there is an existing system to floodlight the steeple's front façade, attention should be given to ensure that all of the fixtures are working properly. Selective floodlighting at the base of each window would highlight the white stone arches at the top of the windows (selective floodlighting). Decorative sconces added above each door would add an inviting appeal to the streetscape view (ornamental).

Techniques used - selective floodlighting, ornamental.

Installation: $3,000 – $7,000
Operation: $250 – $600

SS Cyril and Methodist Church

Figure 5-49

From the exterior, the stained glass windows could benefit from small spotlights mounted on the interior of the church. This type of fixture would utilize a lamp with a high color temperature to accentuate the blue hues of the glass (transmitted luminance). Bringing these windows to life at night would play an important role in the streetscape image of the church. In addition to the windows, the steeple would benefit from building mounted flood lights (floodlight).

Techniques used - transmitted luminance, selective floodlighting.

Installation: $2,000 – $3,500
Operation: $250 – $450

St. John's Capistrano Church

Figure 5-50

Replacing the two utility fixtures that flank the main entrance with decorative fixtures would greatly enhance the front doors. This would also create a warm and inviting statement to all that pass by (ornamental). The existing steeple lighting should be maintained to ensure proper operation. Soft floodlighting of the front and side of the church would help ground the building and further enhance the streetscape view (floodlighting).

Techniques used - ornamental, flood lighting.

Installation: $500 – $5,000
Operation: $100 – $450

St. Stanislaus Church

Figure 5-51

Decorative pier-mounted lights at the unique entry stair walls would help provide an inviting street level appearance (ornamental). Soft floodlights could be added to accent the details of the structure (floodlighting). All lighting should be at low levels and soft.

Techniques used - ornamental, soft floodlighting.

Installation: $3,000 – $5,000
Operation: $200 – $300

Holy Bethel Pentecostal Church

Figure 5-52

Soft floodlights from near the retaining wall could gently light the entire exterior of the structure (soft floodlighting). This form of floodlighting allows the church to have a comfortable street presence.

Techniques used - soft floodlighting.

Installation: $600 – $800
Operation: $150 – $200

Concordia Lutheran Church

Figure 5-53

Small spotlights mounted on the interior to backlight the glass would best serve the ornate stained glass windows to either side of the entrance (transmitted luminance). On the exterior, the columns that line the sides of the building could be uplighted from ground level. This can be done through the use of in-grade well lights or small above ground spotlights (floodlighting).

Techniques used - transmitted luminance, floodlighting.

Installation: $1,000 – $3,500
Operation: $150 – $350

PB & NE Railroad Building

Figure 5-54

General floodlighting could make this landmark building an anchor at the end of town. The floodlights should be placed relatively close to the building to pick up some of the brick texture without being so close that they accentuate any imperfections (grazing floodlight). If lighted, this building should be a relatively bright, landmark-style structure.

Techniques used - grazing floodlight.

Installation: $5,000 – $7,000
Operation: $400 – $600

Holy Ghost Preschool

Figure 5-55

The dark color of the stone makes this building a very difficult structure to light. Highly selective floodlighting should be used to highlight the details of the building. Small floodlights integrated into the window sill can highlight the windows and roof line (selective floodlighting). Special attention must be paid to the street level entrances to ensure this building is inviting at night. Decorative wall mounted lighting is suggested (ornamental). The overall level of light on this building should be soft and subtle.

Techniques used - selective floodlighting, ornamental.

Installation: $5,000 – $6,000
Operation: $300 – $400

IMPLEMENTATION

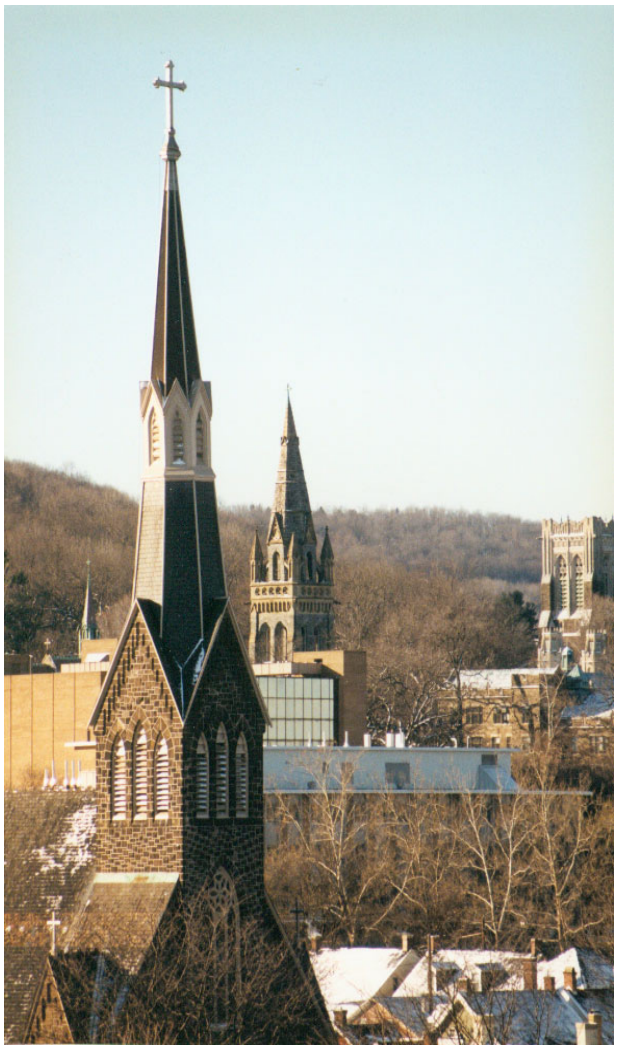

Figure 6.1 *Steeples in winter*

A comprehensive architectural lighting master plan is a significant undertaking for any municipality. When an agreement on the basic lighting concepts is achieved, an implementation program must be developed. The following chapter suggests guidelines on prioritization of projects, phasing specific projects, the use of mock-ups, the creation of ordinances, concerns about ongoing maintenance, and how to update the lighting master plan in the future. **The topics in this chapter are suggestions only, not mandatory restrictions or guidelines.**

Prioritizing the City

Because a plan like this involves many individual building owners or organizations to independently fund projects, the ultimate implementation of the lighting master plan may take many years. Through public involvement in the planning and implementation stages, excitement over the lighting projects can be generated.

It is important to make several strong and highly visible gestures throughout the South Side at the onset of the program. Selecting a few buildings to begin the program can have great effects. The building owners

who are approached about being part of the initial round may feel a sense of honor and pride about having their building selected. As these buildings are turned into striking nighttime landmarks, they become the best motivational tool for other building owners. As more structures become illuminated in an appropriate manner, the excitement will build.

It is better to fully plan your lighting project before starting any phase of construction.

The initial projects will be very important to the long-term success of the plan. Creating a strong and bold statement will generate very positive feedback if done properly. However, if glaring, over lit, or poorly done the negative feedback will be difficult to overcome.

Phasing Each Building

All construction projects require an initial and maintained cost. Often the cost of implementing a full design and construction project is prohibitive for a building owner. Fortunately, **not all lighting projects require the implementation to be completed in one phase.** Often incremental steps can be used to reach a final goal. Although the overall project may be broken down into smaller pieces, in between phases the building does not have to look like an incomplete project.

A church may be an easy type of project to phase. The church might have the money to restore the historic fixtures outside the front entry. This greatly increases the streetscape appearance of the building. As a result, a donation might be given to backlight the stained glass window at the front of the church, further enhancing the streetscape appearance. These projects then generate enough excitement that a fund raising committee is organized to raise money to light the steeple. Over time the church reaches its full nighttime potential and the initial cost was distributed over a period of time.

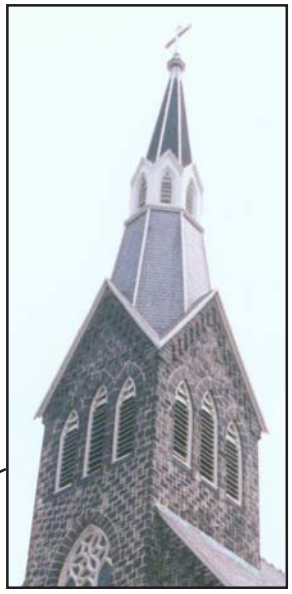

Figure 6.3 *Steeple*

It is recommended that when a building owner plans to do a phased project, they should keep the ultimate goal of a beautifully lighted building in mind. **That often means planning for the final result initially and then constructing in phases.** The incremental decisions made at each phase could lead to a less than desirable final appearance. This idea is reflected in the old adage “measure twice, cut once,” which implies it is better to fully plan your project prior to implementing. Balancing light, shadow, color, texture, and intensity

Figure 6.4 *Stained glass*

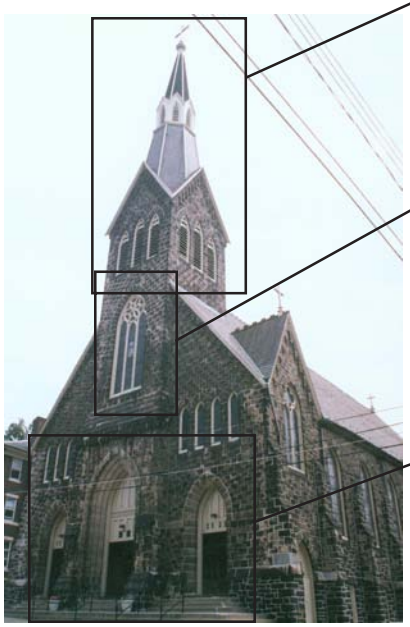

Figure 6.2 *Holy Infancy Church*

Figure 6.5 *Main entry doors*

is easiest when the design is comprehensive and complete before any construction begins.

Mock-ups and User Evaluations

Test areas and mock-ups are extremely valuable for a number of reasons. They give perspective and better define the scope of work, length of construction periods, nuances in design or construction, possible conflicts, and finally, public reaction.

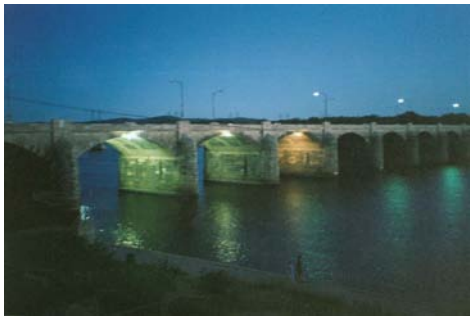

Figure 6.6 *Market St. Bridge mock-up, Harrisburg, Pennsylvania*

Mock-ups allow a designer to better convey the concepts to the owner with minimal cost to the owner. This ensures that the building owner will not be surprised and feel too much or too little light was provided, and that light is applied where it is desired.

Mock-ups also teach the design team about valuable building-specific information, such as ambient light conditions or details about wall conditions. A specific example could be a wall that was intended to be grazed with light. When the mock-up occurs it is discovered that about 10 feet up, the wall starts leaning back and the rest of the wall is in shadow. The light exaggerates the slight lean in the old wall and makes the building look unsafe. In this case the mock-up might show that a floodlight aimed straight at the wall would be more attractive. Another example could be adding decorative fiber optics to a structure and at the mock-up the building owner decides they would sooner have a brighter source like neon, even if it does not change color.

A mock-up also allows the owner to see how their building will look in context with other structures on the street and skyline. That concept of using an ornamental fiber optic light may seem great on paper, but it may look out of place on the street with other subtlely floodlighted structures.

Covenants and Ordinances

At this time the City does not have ordinance provisions requiring the review of commercial lighting. Although this plan recommends the installation of architectural lighting on significant buildings and structures, it by no means recommends that all lighting is appropriate or that no review of lighting could be necessary in the future. Many communities have ordinances requiring the review of lighting plans for new commercial or nonresidential construction, including parking lot lighting. Any future review of an owner's lighting installation should be based, as much as possible, on numerical evaluation to minimize disputes over aesthetics. Categories for review could include spill light, illuminance (or brightness), and sign lighting. Ordinances could be developed to address the many vacant lots left by Bethlehem Steel and other new parking facilities. As downtown grows in popularity, safety in parking areas will be a major concern.

Figure 6.7 *Beth Works parking lot*

However, the light levels in parking lots throughout the South Side should not outshine the downtown attractions. Sample ordinances could be found from other communities or design professionals. The

Architectural Lighting Committee, with the support of the City of Bethlehem, could work toward establishing solid lighting ordinances to control future lighting installations.

Preventative Maintenance

Wouldn't it be nice if everything looked as good as the day you first purchased it? Routine maintenance is easy to remember on certain things. For example most people remember to wash their cars occasionally and change the oil every 3,000-4,000 miles. We do these things because we know they help maintain the vehicle's looks and reliability and avoid much more costly repairs in the future. A lighting system is very similar. Occasionally cleaning and relamping the fixture will keep it operating like new.

Figure 6.8 *Eliminate glaring fixtures*

Figure 6.9 and 6.10 *Poorly maintained light fixture*

Cleaning cycles depend on many things: how dirty the surroundings are affects the dirt accumulation, the direction the fixture can be aimed, the ability of the rain to wash the fixture clean, and so on. All light fixtures should be checked on a regular basis after a new installation to establish a cleaning program. Figures 6.9 and 6.10 show a floodlight mounted on a canopy in downtown Harrisburg. During the summer months the mayflies were attracted to the light and died on the lens. This accumulation of bugs trapped the heat inside the fixture and led to the lens breaking due to heat stress. As a result, the bugs fell into the fixture. In a few short nights the bugs filled the fixture and created a significant fire hazard. Regular cleaning of the lens could have prevented this.

Along with routine cleaning of the exterior of the fixture, the interior should be cleaned at every lamp change. The exterior of the fixture should be inspected, and any damage should be repaired immediately. It is highly recommended that group relamping be done. Group relamping simply means that the lamps are replaced in all of the fixtures at one time. This typically occurs around 70% to 75% of the rated lamp life. With modern high efficiency lamps, many reach the end of their useful life before they completely burn out. Thus, if one lamp is replaced before the rest, it can have a different color or brightness. In addition, it is often more economical from a material and labor standpoint to replace several lamps at a time than to get the equipment and replace one lamp this week and another next week, and so on.

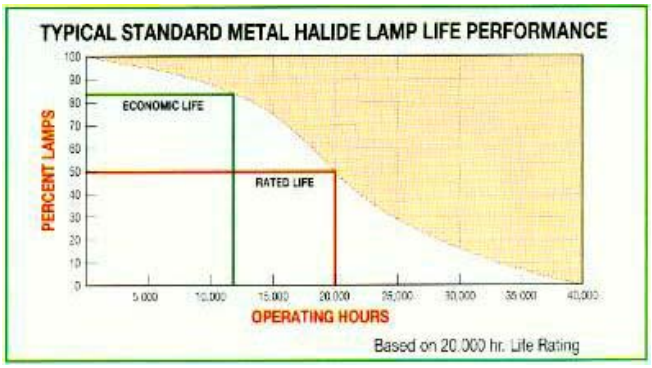

Figure 6.11 *Lamp Life Performance Chart*

Because the South Bethlehem facade lighting program puts the responsibility of maintenance on many individual building owners, control of the maintenance will be difficult. It is recommended that building owners submit a maintenance schedule and plan with the design documents for review by the Architectural Lighting Committee. The owner should also sign a maintenance agreement stating that they plan to adhere to the plan as submitted and approved. This agreement is simply a "statement of intent" and not intended to be a legal document.

Updating the Master Plan

Recognizing the potential for obsolescence inherent in any planning document, it is strongly suggested that a review procedure be established to update and revise the lighting master plan. Regular reviews should be carried out by representatives from all public agencies and private citizens' groups concerned with the visual environment of downtown South Bethlehem. The principles of perception and visual communication on which this particular plan is based should drive decisions for updating it.

As projects are implemented, the plan should be updated to reflect the actual project. Perhaps a new lighting map could be created indicating the existing buildings and which are highlighted. This map can then be added to as new structures are built and/or lighted. The techniques used should be documented and a photo of the finished building should be kept as part of this document. This allows the committee to track the progress and adhesion to the plan, as well as quickly make decisions regarding new projects next to previously illuminated buildings.

Other Improvements to be Studied

The architectural highlighting of buildings and significant structures should be one key element of the revitalization program for South Bethlehem. In conjunction with the South Side Master Plan and this document, comprehensive planning should be done for other detailed aspects of the streetscape.

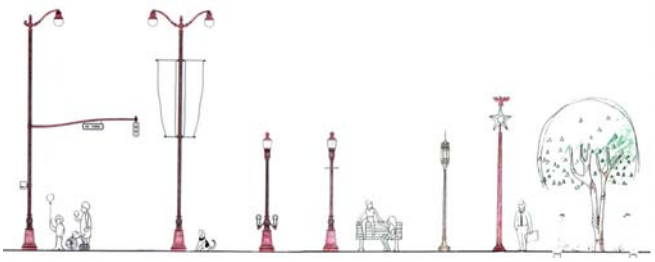

Figure 6.12 *Sample light fixture palette from Harrisburg*

Pedestrian and vehicular lighting along the streets should be planned. Selecting a fixture to be used on a street based on a whim or personal preference might not lead to a cohesive downtown area. The South Side Master Plan clearly defines districts and corridors within the South Side. These areas could be defined by the streetlights and furniture. For example, the retail district may want more light and fixtures with more vertical light. On the other hand, citizens in a residential area want a safe amount of light, but do not want it entering their bedroom windows. Scale and type of fixture can help define vehicular versus pedestrian areas or potential conflict intersections. A small palette of fixtures should be created and an overall concept for how and where to use those fixtures should be generated. This way future decisions are not based on an individual preference.

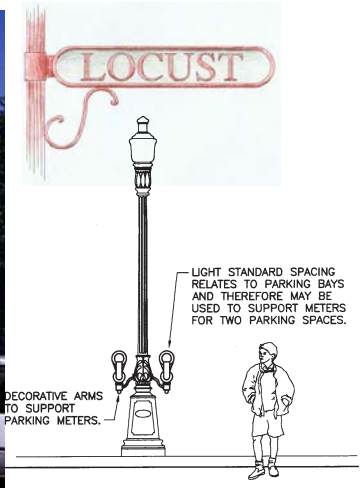

Figure 6.13, 6.14, and 6.15 *City enhancements*

Public signage and traffic signals are another major concern for making the downtown more accessible to visitors. Clearly marked streets and buildings make it easier for visitors to find their way. An integrated plan of streetlights, signage, and signals creates an easy to follow, intuitive system that makes visitors and residents feel welcome. Integrating such features as parking meters, planters, and banners can further enhance the overall streetscape view. The use of kiosks and other informational devices can further enhance the accessibility of the city. Kiosks provide a public posting area and prevent the city's hardware from being vandalized by flyers.

Developing solid landscaped parks or entry gates to the South Side could help to anchor the architectural lighting plan. The rail to trail program through downtown, as suggested by the South Side Master Plan, would be an excellent project to provide a pedestrian corridor to tie many of the significant structures in town together. Through quality landscape with integrated lighting, this project could become the ribbon that ties the whole city and the architectural highlighting plan together.

Figure 6.16 *Potential Linear Park*

Summary

Through private and public investment, the nighttime view of the South Side of Bethlehem can become very dramatic, exciting, and inviting. Displaying the strong religious and diverse ethnic backgrounds by highlighting the many historic places of worship gives the community a unique sense of history and pride. Strong support from the University and businesses downtown can draw students into the business district for shopping and dining after class. Humans are social creatures and as excitement builds in the downtown, more people will join. As the streets become busier, more businesses will open and this cycle leads to more revenue for the city and opportunity to do more redevelopment projects.

Fig. 6.17 *Steeples in summer*

APPENDIX A

CHECKLIST

- ☐ Read Lighting Master Plan, become familiar with terminology of lighting techniques, etc.
- ☐ Gather funds
- ☐ Contact lighting designer
- ☐ Discuss proper lighting for the building in question, following guidelines of Lighting Master Plan
- ☐ Designer to create plans and/or specifications
- ☐ Owner to contact Architectural Lighting Committee for review of intended facade lighting
- ☐ Perform mock-up, if desired/necessary
- ☐ Installation

PHOTOGRAPHY CREDITS

Figure 1.5 Downtown Disney
Lighting Design + Applications magazine
Figure 1.6 Steeples in winter
Bob Thompson
Figure 1.10 Musikfest
South Bethlehem Historical Society
Figure 2.8 Color washing of facade
Lighting Design + Applications magazine
Figure 2.9 Example of color on streetscape
Lighting Design + Applications magazine
Figure 2.10 Grazing of wall
Lighting Design + Applications magazine
Figure 2.11 Example of grazing
Lighting Design + Applications magazine
Figure 3.19 Sinai Samaritan Medical Center
Lighting Design + Application magazine
Figure 6.1 Steeples in winter
Bob Thompson
Figure 6.17 Steeples in summer
Bob Thompson

Note: All images not listed above but appearing in the report have been provided by employees of Brinjac Engineering, Inc.

APPENDIX C

MAPS